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In THE MUNICIPAL INDEX (an 875-page annual volume published by American City Magazine Corporation) readers will find much material, including articles, lists and bibliographies on a wide variety of municipal and civic subjects, not published in the monthly issues of THE AMERICAN CITY.

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Artist's conception of Barbara Frietchie's Home in Frederick, Maryland

DeLavaud Pipe . . .

supplies and protects the historic town of Frederick, Maryland

FREDERICK, MARYLAND is associated in the minds of most Americans with the story of dauntless Barbara Frietchie —she who defied the invading troops to destroy her country's flag. Just how much the present-day town of Frederick cherishes the memory of its heroic daughter is shown by the beautiful Barbara Frietchie monument and the charming replica of her little home (shown above).

To serve and to protect the town of Frederick, Whitman, Requardt & Smith, Consulting Engineers, specified 18,000 ft. of deLavaud pipe for underground water mains. For deLavaud pipe is the strongest pipe ever cast. It is produced by pouring molten iron into a rapidly revolving cylindrical mold. The metal of the pipe thus formed is dense, fine-grained and remarkably free from impurities.

"We have found deLavaud pipe to be satisfactory in every respect," writes E. St. C. Maxwell, City Engineer of Frederick. "We find it to be a stronger pipe than sand cast and at the same time to cut and tap with ease. The absence of the bead facilitates assembly and produces a joint with greater flexibility."

DeLavaud Pipe is made in accordance with U. S. Government specifications. We are also furnishing this product in the various thicknesses and weights shown in the specifications of the American Water Works Association and the American Gas Association. The deLavaud Handbook gives complete information. Write for free copy today.

United States Pipe and Foundry Co., Burlington, N.J.

Sales Offices:
New York, Philadelphia, Pittsburgh, Cleveland, Buffalo, Chicago, Dallas, Birmingham, Kansas City, Minneapolis, Seattle, San Francisco, Los Angeles

Our pipe bears the "Q-Check" trademark of The Cast Iron Pipe Research Association

WELFARE and RELIEF Mobilization

Planned for 376 Cities

A Nation-Wide Attack

AMERICA'S nearest peace-time approach to war-time unity of effort in a nation-wide drive for funds is expected to be realized in the 376 cities of 25,000 population and over, between October 19 and November 25 next. The occasion will be the Welfare and Relief Mobilization now being organized under the leadership of the Association of Community Chests and Councils, at the request of President Hoover's Emergency Committee for Employment, with the object of mobilizing all local resources, public and private, for local use in meeting the nation-wide problem.

Of the 376 cities in the 25,000 and over class, 244 have community chests*; in the other 132, emergency relief work last winter and the winter before had been handled by family welfare associations, public departments and by special citizens' committees. In the chest cities the program will be handled by the chests; in the 132 non-chest cities the assistance of the Association will be offered in setting up temporary financing bodies to function during the general period of solicitation.

Not Only Relief

ONE of the cardinal objects of the Welfare and Relief Mobilization is to preserve the complete community welfare program during this difficult period. The A. C. C. C. urges that specialized welfare services be not forgotten in spectacular campaigns for emergency relief. As one welfare leader has phrased it: "We cannot sidetrack ten years of progress in social planning just because we are confronted by an extraordinary relief situation." During the entire critical period the chests have been insistent upon the need for relief funds, but at the same time they have continued to champion those preventive and constructive activities which contribute so much to raising the American standard of living—such activities as public health, character-building, organized recreation and supplementary education. This policy will remain in force in chest cities, and, it is hoped, will be adopted by emergency committees in non-chest communities. The all-inclusive program is to be vigorously recommended as aiming at reconstruction and rehabilitation along permanent lines rather than at merely ameliorative measures.

Public Appropriations Essential

POINTING out that dependence cannot be placed wholly or chiefly on private philanthropy, the A. C. C. C., in a recent statement, says:

"Emphasis upon the need of local public appropriations is based upon the acknowledged limitations of private philanthropy in face of steadily mounting relief needs in the various communities. A study made by the Department of Labor of 100 typical cities shows that last year 72 per cent of the entire relief burden was met from local [public] funds. This same ratio will at least have to be maintained, and may well have to be substantially increased, to meet the burden this fall and winter.

"It is to be made clear that community chests and other private agencies must secure gifts this year as at no time since the war, but every effort will be made to point out that the bulk of the direct relief bill in most places will have to be met through local tax resources. To what extent this can be done will vary with conditions in the various communities, but the necessity for supplementary appropriations is impressively emphasized with the gradual exhaustion of special relief funds privately raised. Moreover, the June *Relief Bulletin* of the Russell Sage Foundation, probably the best of the barometers of the situation, points to indications that 'in a good many cities, at least, the normal sources of relief funds have not yet been severely taxed.'

"Private philanthropy has responded valiantly thus far in discharging its share of the responsibility for relief and for the many complex human ills and maladjustments growing out of the depression. Local public authorities are to be asked to exert the same type of social vision—to confer with private agencies to determine accurately and intelligently where private resourcefulness leaves off and where public responsibility begins. Many officials have expressed themselves as seeing in the present emergency an extraordinary opportunity for constructive cooperation with private organizations in developing a greater degree of community self-reliance."

A GRAPHIC APPEAL

The poster of which a reproduction is shown above comes in six colors and in various sizes, with space for the name of the local fund and the dates of the local campaign. It may be ordered in quantities at special prices from the Association of Community Chests and Councils, Graybar Building, New York City

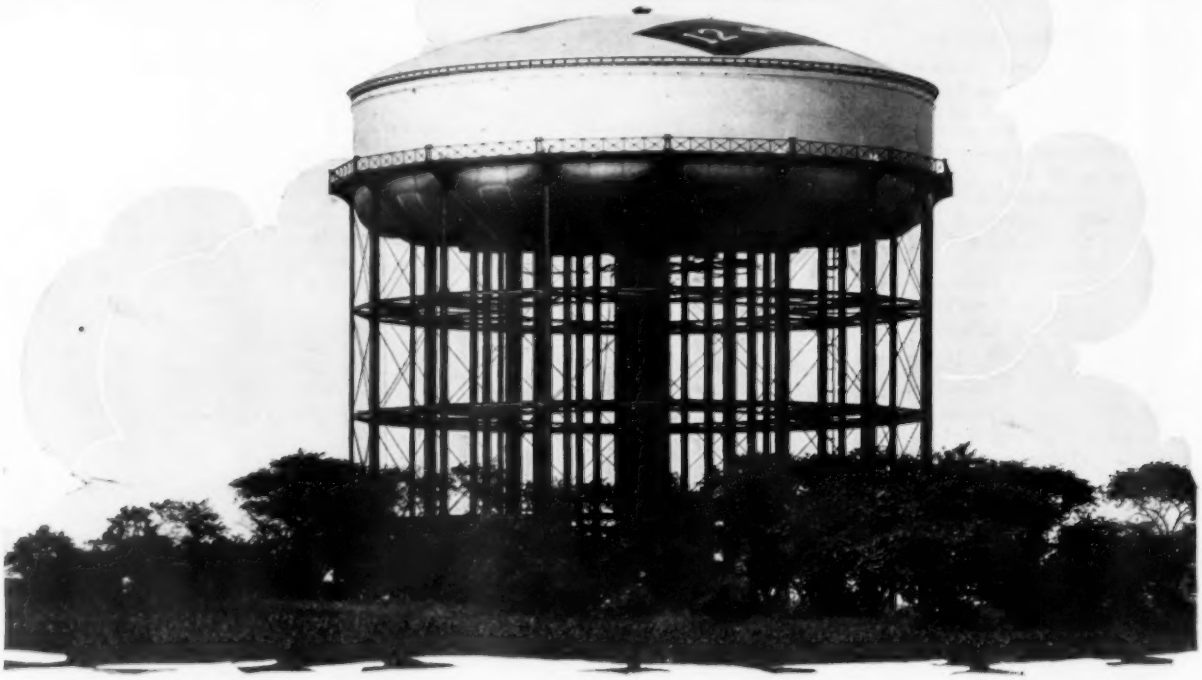
Cooperation from Washington

The Welfare and Relief Mobilization promises to be one of the most important elements in the general program of unemployment relief and business stabilization which Walter S. Gifford, of New York, has been asked to lead as head of the President's Organization on Unemployment Relief. Details of the relationship between the two groups are now being worked out.

As explained in the White House statement of August 19, the principal purpose of the Federal organization in Washington to be set up by Mr. Gifford will be "to cooperate with the public authorities and to mobolize the national, state and local agencies of every kind, which will have charge of the activities arising out of unemployment in various parts of the nation this winter."

*In all, there are 382 community chests in the United States, 244 in cities of 25,000 or more, the remainder in smaller cities.

Indianapolis Cuts Peak Pumping Rates



THE 1½-million-gallon radial-cone bottom Horton elevated tank recently installed by the Indianapolis Water Company as illustrated above, is another example of the advantageous use of elevated storage in municipal water supply systems.

During the summer of 1930, booster stations had to be run on 123 days at rates from 6 to 16 million gallons per day. With the tank in service, the 1930 season would only have required booster station operation for a total of 20 hours, distributed over 13 days and then at nominal rates only. The peak pumping rates are cut in half by this new tank since the stored supply is drawn upon for one-half the peak demand. This reduction in peak pumpage releases 10 million gallons per day pump-capacity for use elsewhere or to increase the safety factor of the reserve pump capacity.

Additional advantages are the improvement in service particularly on higher ground where pressures have been unsatisfactory on days of heavy demand, and the additional fire protection afforded by the tank. There is also a saving in pumping costs due to the lower friction head losses in the mains because the tank can be filled at night when these losses are at a minimum.

Mr. W. C. Mabee, Chief Engineer of the Indianapolis Water Company summarizes the reasons for using adequate elevated storage as follows—

1. *Elevated storage advantageously placed affords an economical solution of many distribution problems.*
2. *It utilizes pipe lines to the best advantage avoiding excessive friction losses which losses represent wasted energy that are reflected back to the coal pile.*
3. *It improves service by supplying quantity and pressure where most needed.*
4. *It improves fire protection.*
5. *Its effect on plants already equipped is to increase the safety factor by releasing equipment for reserve pumping capacity.*
6. *It postpones the installation of additional plant equipment devoted to the distribution of water.*

Horton shallow-depth tanks insure the attainment of the maximum economies from elevated storage. Our nearest office will gladly furnish you information and estimates on such a tank for any conditions you may be confronting.

CHICAGO BRIDGE & IRON WORKS

Chicago.....2127 Old Colony Bldg.	Boston.....1501 Consolidated Gas Bldg.	Houston.....1101 Electric Bldg.
New York.....3108 Hudson Terminal Bldg.	Birmingham.....1502 Fiftieth St., N.	Tulsa.....2425 Exchange Bank Bldg.
Cleveland.....2236 Midland Bank Bldg.	Dallas.....1206 Burt Bldg.	Los Angeles.....1303 Pacific Mutual Bldg.
Detroit.....1501 Lafayette Bldg.	San Francisco.....1033 Rialto Bldg.	Havana, Cuba.....Apartado 2507
Philadelphia..2616-1616 Walnut Street Bldg.	Seattle.....4343 Smith Tower	Cable Address.....Chibridge

HORTON TANKS

AC9-G145

Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Improvements to New Jersey Water System

ONE undertaking for which the contract has already been awarded, in the $1,000,000 improvement program which will be carried out by the Hackensack Water Co., serving 51 communities in Bergen and North Hudson Counties, New Jersey, involves the construction of a 52-inch steel pipe line 38,000 feet long. A second project is the new 5,000,000-gallon concrete service reservoir and connecting pipe line in northern Bergen County.

The 52-inch line, to be built by the T. A. Gillespie Co., will run from the company's pumping station at New Milford to Sheffield and Grand Avenues, Englewood, and will be connected at various points with existing transmission mains running from New Milford to the southern end of the water system. Installation of this line will result in betterment of service not only in Union City, Weehawken and other Hudson County towns, but also in communities throughout Bergen County which are supplied by this company. Water pressures will be more uniform over the entire system, and the danger of interruptions to service will be minimized.

Owing to the present low level of prices, going ahead with this work now means the saving of an appreciable capital outlay to the company and to its consumers. Unemployment in the company's territory will be mitigated, as it is planned to employ local labor to the greatest possible extent.

Contracts for the Northwestern reservoir, to be located on an elevation at the western side of the borough of Woodcliff Lake, have been let. This development, too, will provide additional employment and improve the service to residents north of New Milford, Dumont and Cresskill.

The 1931 construction program of the company continues, on a larger scale, additions to plant and improvements to service made during the previous year, when the total spent for additions was $1,354,379.34.

NICHOLAS S. HILL, JR.,
President, Hackensack Water Co.

Cast Iron Pipe for Natural Hot Water Distribution

AN unusual installation of cast iron pipe has recently been completed at Boise City, Idaho, by The Natatorium Co., to handle natural hot-water distribution.

In 1890 it was decided to prospect for hot water on a peculiar spot about an acre in extent which was never covered with snow and which was always a regular quagmire. An option for 10 acres in this immediate neighborhood was secured, and a well was drilled to a depth of 400 feet, where a good flowing supply of hot water was encountered. Another 6-inch well was drilled close by, and a supply aggregating 800,000 gallons per day was obtained without pumping. The temperature of the water at the well is 170 degrees Fahrenheit, and the supply secured is inexhaustible. The wells have now been in operation for 41 years and the temperature of the water has never varied winter or summer during that period. A chemical analysis shows that the water contains several harmless and beneficial minerals.

In 1891 the four original owners sold the property to the Boise Artesian Hot and Cold Water Co., which began construction on a natatorium which was opened for business in 1892. Shortly after the completion of the natatorium, the hot-water pipe line was extended to the city.

After various unsuccessful attempts to increase the supply by drilling more wells, a new 10-inch well was dug and one of the existing 6-inch wells was enlarged to 10 inches. Two new Byron Jackson 5-stage perpendicular centrifugal pumps were installed 150 feet below the surface in each well. The pumps are electrically driven and have increased the supply to 1,200,000 gallons per day.

The original pipe lines were of wood, but in 1896 metal lines were installed to serve all the consumers for both heating and domestic purposes. The transmission mains are 10- and 12-inch pipe while the service-runs and branch lines are from ¾- to 2-inch pipe. The corrosive effect of the dissolved air in the water has been so violent that in the summer of 1930 the transmission mains were replaced by deLavaud centrifugal cast iron pipe, which has a very high resistance to corrosion. The installation consists of 8,541 feet of 10-inch deLavaud pipe equipped with Anthony joints and was laid while the streets of Boise City were torn up incident to improvement and resurfacing by the city. There are 213 consumers of hot water for heating purposes, as well as 70 consumers of hot water for domestic purposes, during the summer.

T. B. JACKSON,
General Manager, The Natatorium Co.

Washing Rapid Sand Filters

THE purpose of washing rapid sand filter beds may be said to be the removal of accumulated coagulant and coagulated sediment deposited on the sand during filtration.

The two methods of washing filters now generally used are: (1) high-velocity wash with a usually applied wash-water rate of 15 gallons per square foot of filter area per minute, or a vertical rise of 24 inches per minute; and (2) low-velocity wash with preliminary air agitation. The wash-water rate in air-water wash varies from 5 to 12 gallons per minute, and air is usually applied at a rate of 4 cubic feet per square foot of filter area per minute and at an applied pressure of 4 pounds.

To the plants using these two methods may be added a large number of small plants that use low-velocity water wash alone, and a small number using low-velocity wash with revolving rakes for mechanical agitation. Any rate of filter wash of less than 20 inches rise per minute without preliminary agitation, or agitation during washing, cannot be expected to properly clean a sand bed.

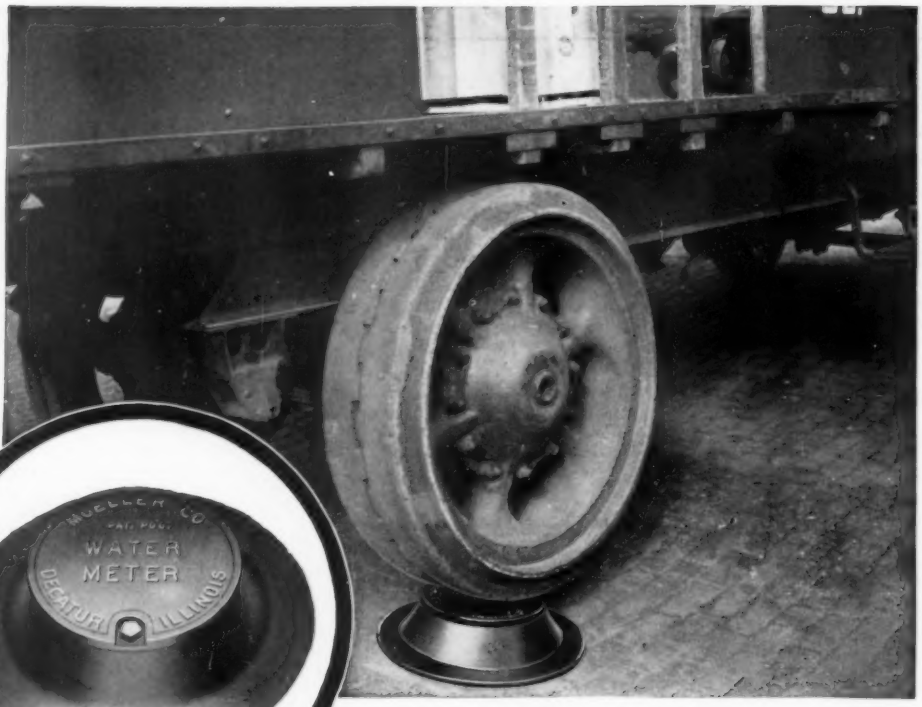
Filters should be washed when a loss of head through the filter of from 7 to 9 feet over the initial loss, is recorded. In plants operating continuously, filters should always be washed when this loss is reached, and in plants where intermittent filtration is required, each filter should be washed at the end of each day's run. In washing, the filter should be thrown out of service and the water drawn down to the top of the troughs before starting the washing process. The wash water should then be applied gradually until the desired rate of flow is reached. Too much emphasis cannot be placed on applying the wash gradually, particularly in plants employing hydraulic valves. A sudden surge of wash water can very easily dislodge a portion of the sand and gravel and virtually ruin a filter. In present-day design, the rate of flow expressed in inches rise per minute is made equal to the height of the wash-water troughs above the sand. If this rate is exceeded, sand may be carried over during washing, particularly if the sand is coated. Too low a rate will not allow proper cleaning. The washing should continue until large clear areas appear in the wash water rising through the filters. This usually requires a wash of four to five minutes duration and a wash-water consumption of from two to four per cent of the entire quantity filtered.

When air wash is used, the procedure is similar except that the water wash is preceded by air agitation for five to ten minutes. This thoroughly agitates the sand bed, and allows cleaning at a lower rate of wash-water application.

Mention might be made of partial washing at times when trouble occurs with air binding or large growths of microscopical organisms. A number of plants, under these conditions, have found it possible to obtain greatly increased filter runs by turning the wash water on just long enough to force the air out of the filter or to break up the mat formed by the organisms. It is worthy of trial in plants troubled with very short runs.

After washing, it is customary in a large number of plants to "rewash" or "filter to waste" for a short period.

MARTIN E. FLENTJE,
Superintendent of Purification, Community Water Service Co., Harrisburg, Pa.



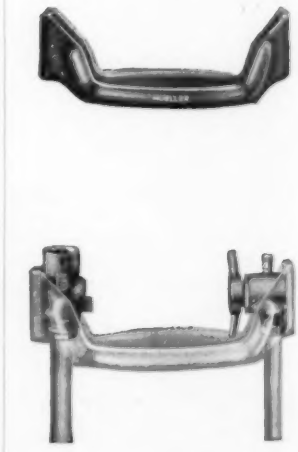
The Story in a picture

The above shows how well a MUELLER Meter Box Cover stands up under a five-ton truck. Not so bad, what?

You see, factors of safety—convenience—and economy now point to the curb as the most practical place for water meters. The MUELLER Meter Box and Yoke was designed to meet the changed conditions of this new location. Well-designed patterns have made possible a casting in the best gray iron of more than usual strength. The special worm-type lock simplifies the problem of cover opening. When it is necessary to remove the meter, uninterrupted service is obtained by simply dropping a nipple in place and tightening it.

This is but one of the many refinements that MUELLER is able to offer through its seventy and more years of familiarity with waterworks problems.

MUELLER CO. (Established 1857) ***Factory:*** **Decatur, Illinois.** ***Branches:*** **New York, Dallas, Atlanta, Los Angeles, San Francisco, Chicago.** ***Canadian Factory:*** **MUELLER, Limited, Sarnia.**



Write today for complete information on the MUELLER Water Meter Box Cover and Yoke and other Waterworks Specialties

MUELLER

Trade-mark Reg. U. S. Pat. Office

Who's Who in Water Supply

The 44th of a Series of Portraits of Water Works Officials Which Has Appeared Monthly Since January, 1928

H. A. VAN NORMAN
Gen. Mgr. & Chief Engr.,
Dept. of Water & Power
Los Angeles, Calif.
(Appointed 1931)

GEORGE H. ADAMS
Supt., Water Dept.
Needham, Mass.
(Appointed 1893)

JAMES G. HILL
Supt., Water Works
Lowell, Mass.
(Appointed 1929)

NELSON A. ECKART
Gen. Mgr. & Chief Engr.,
Water Dept.
San Francisco, Calif.
(Appointed 1930)

H. V. MACKSEY
Supt., Public Works
Woburn, Mass.
(Appointed 1928)

JEAN L. VINCENZ
Commissioner of Public Works
Fresno, Calif.
(Appointed 1931)

W. W. ALBIN
Supt., Water Dept.
San Diego, Calif.
(Appointed 1914)

JOHN BURT
Gen. Mgr., Marin
Municipal Water District
San Rafael, Calif.
(Appointed 1916

FRANK A. OLSEN
Supt. & Chief Engr., Sunny
Slope Water Co.
Pasadena, Calif.
(Appointed 1912)

VICTOR E. TRACE
Supt., Water Dept.,
Santa Barbara, Calif.
(Appointed 1900)

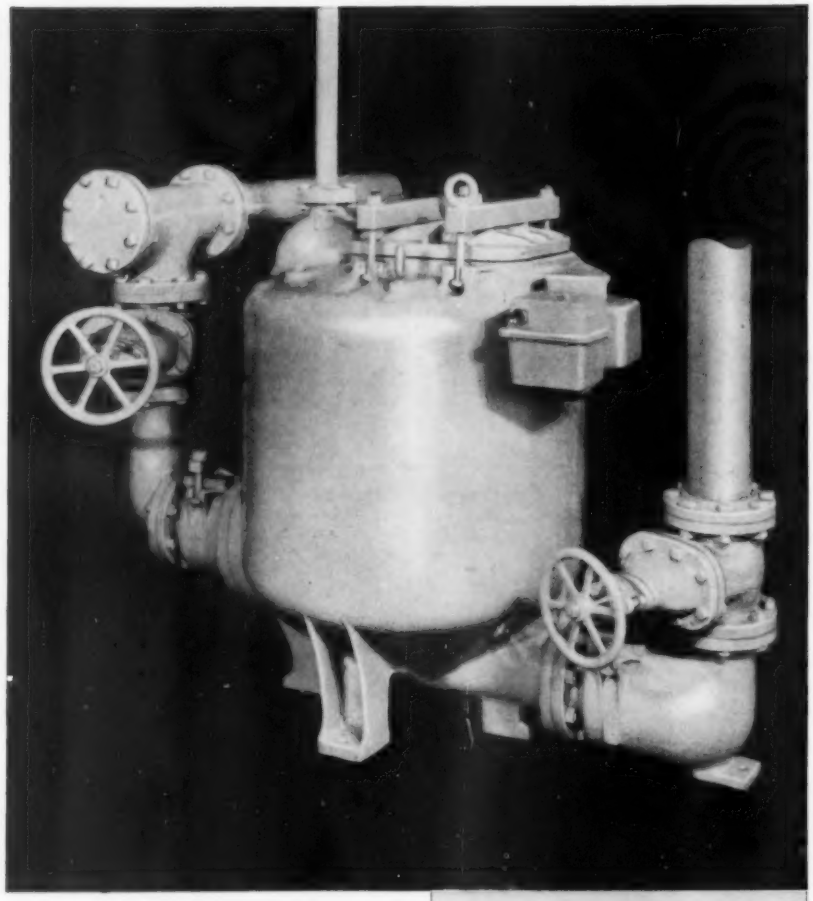
A. I. OLDING
Supt., Water Works
Redfield, S. Dak.
(Appointed 1929)

ALBERT A. ROSS
Supt., Water Dept.
Lexington, Mass.
(Appointed 1923)

WILLARD E. BURNAP
Supt., Water Works
Whitinsville, Mass.
(Appointed 1903)

ROBERT FRANKLIN PRIEST
Supt., Water Plant
Gloster, Miss.
(Appointed 1920)

INSTALL THIS EJECTOR *then* FORGET IT



Jennings Pneumatic Sewage Ejectors are furnished in several sizes with capacities of 30 to 1500 g. p. m. Heads up to 50 ft.

•

VACUUM PUMPS AND COMPRESSORS FOR AIR AND GAS • • RETURN LINE AND AIR LINE VACUUM STEAM HEATING PUMPS • • CONDENSATION PUMPS • • FLAT BOX PUMPS • • CENTRIFUGAL PUMPS • • SUCTION (SELF-PRIMING) CENTRIFUGAL PUMPS • • SUMP PUMPS SEWAGE PUMPS • • PNEUMATIC SEWAGE EJECTORS

*I*N booster stations where there are no attendants to supervise operation, sewage pumping equipment must, above all else, be dependable. That is just the sort of service in which the Jennings Pneumatic Ejector distinguishes itself.

The Jennings Ejector is the simplest and most trouble-free of ejectors. It consists of a receiving pot, a float switch and a Nash Hytor Compressor. Air is compressed only to the pressure required to move the sewage. There are no air valves to get out of order, no air storage tanks to leak and cause trouble. A Jennings is good for years of service with a minimum of attention.

For complete information on Jennings Pneumatic Sewage Ejectors, write for Bulletins 103 and 108.

NASH ENGINEERING CO.
14 Wilson Rd., So. Norwalk, Conn.

Jennings Pumps

Sewage Treatment Means Clean Streams

SEWERAGE and SEWAGE DISPOSAL

Sewage Treatment Ordinances in Peoria

THE Greater Peoria Sanitary District has recently passed general ordinances regulating the construction and use of sewers and the treatment and disposal of sewage. Peoria, Ill., has a large amount of industrial wastes, and the funds provided by law through the issuance of bonds and levying of general taxes are not sufficient to construct sewage treatment works adequate for complete treatment of both industrial and domestic wastes. Adjustment of plant processes and reduction of wastes by the various industries is possible and should be first attempted and thoroughly tried out before buliding such a large disposal system as would be required for complete treatment.

In preparing ordinances for the Peoria District, it has been felt advisable and found helpful to prepare this list of objectives:

1. To limit the extension of combined sewers and prohibit them wherever possible.
2. To extend the use of separate sewers.
3. To prevent the construction of poorly built and leaky house connections to sewers.
4. To protect the property and structures of the Sanitary District.
5. To regulate and control the quantity, kinds and character of sewage (especially from industries) discharged into the sewage disposal system.
6. To secure good construction of new sewers and reduce ground water infiltration.
7. To prevent local nuisances.
8. To protect water supplies, watercourses and ponds.
9. To provide for the construction of sewage disposal plants for the disposal of industrial wastes, together with maintenance and operating costs over and above those covered by normal taxes.

Ordinances of the Sanitary District must not conflict with the statutes and laws of the state of Illinois and they should harmonize so far as possible with ordinances of the city or village within the boundaries of the sanitary district.

A. L. ANDERSON,
Attorney, The Greater Peoria Sanitary District.

Tracing Oil in San Antonio's Sewers

THE city of San Antonio, Texas, with a population of 250,000, disposed of its sewage by broad irrigation prior to the construction of an activated sludge plant, and little attention was paid to oil in the sewage. In July, 1930, the activated sludge plant was close to completion when it was found that the amount of oil in the sewage was so great that it would be impossible to build up activated sludge without elimination of the oil.

Visits were paid to garages, filling stations, machine shops and railroad yards, explaining in each instance the harm caused by the practice of dumping oil into sewers. At the same time an educational campaign was carried on through the public press, pointing out the necessity of safeguarding the new sewage plant, which was built at a cost of $900,000. The results of the campaign were gratifying, but the oil, although diminishing in quantity, was still polluting the plant. To obtain tangible evidence and confront the guilty parties with actual proof of violations, the following procedure was finally adopted.

A number of wooden floats were suspended in manhole openings at the intersections of main and lateral sewers in such manner as to float in sewage at low tide. The floats were 6 x 6 inches square, made of 2-inch lumber, painted with flat white paint, and were equipped with screw-eyes for attaching a strong fishing line, which in turn was tied to the manhole steps.

The paint, coming into contact with oil floating at the surface of the sewage, retained a distinct black oil line. By examining the floats periodically every two or three days, sewers which showed no oil pollution could be eliminated, and lines contributing to the nuisance could be followed up. In this manner, by process of elimination, it was possible to isolate sections which showed the greatest amount of oil, and finally to trace individual offenders. When confronted with actual proof of the violation, the responsible parties, without exception, agreed to remedy the trouble, some going to considerable expense in building elaborate oil-traps.

As a consequence, after a vigorous campaign which lasted about three weeks, the oil was eliminated. Upon rare occasions, we still receive a slug of oil, but, since the floats remain in service at strategic points, we have no trouble in tracing its source.

W. S. STANLEY,
Chief Chemist, San Antonio Sewage Treatment Plant.

Ordinance Provides Schedules of Rates for Sewage Treatment

THE City Council of Mason, Mich., recently adopted an ordinance setting up a schedule of rates and providing for the payment and use of the funds received for the collection and treatment of sewage by the city.

For residents with unmetered water service, the charge is $5 per year for single dwellings, $9.50 for two-family houses, and $4 for each additional family in one building. Where water is metered, the charge is 12½ cents per 1,000 gallons of water used, provided the consumption does not exceed 5,000,000 gallons per year, the minimum charge being $1 per year. The charges will be billed semi-annually and are subject to a discount of 20 per cent if paid before April 10 and October 10.

The ordinance provides that all the money collected shall be kept in a separate fund and used only for the payment of the costs and expenses of the management, maintenance, operation and technical supervision of the sanitary sewerage system and the sewage disposal plant, with any surplus which shall accumulate to be set aside as a sinking-fund for the payment of the cost of construction, repair and extension of the sewage disposal plant and any outstanding indebtedness against it. No portion of the money may be used for the extension of the sewerage system or for any other purpose whatsoever, according to the ordinance.

It is expected that the ordinance will provide between $5,000 and $6,000 per yer, and it is pointed out that those whose homes are not connected with the sanitary sewerage system will not have to pay for the upkeep of the system.

There is a bonded indebtedness of $15,000 on the present sewage disposal plant, and the intention of the City Council was to raise enough money by a use charge to pay off these bonds at the rate of $2,500 per year, the balance of the money raised to be used for fixed and operating charges. There is some question as to the interpretation of the statute under which this ordinance was passed and, as the bonds issued are a liability of the city at large and not so-called mortgage bonds, the probability is that the rates will be cut approximately in two and the money so raised be used for fixed and operating charges only.

W. E. ZIMMER,
City Engineer.

Requirements for Sewer Connections in St. Charles

IN making joints in vitrified and concrete sewer pipe, St. Charles, Mo., ordinarily uses a cement mortar joint. When the pipes are laid in water or mud, an asphalt joint is used, to prevent infiltration.

In laying mains, Y's are left for future house service installations, to obviate the necessity of breaking into the sewer for connections when services are installed. Only licensed plumbers are allowed to make connections. All plumbers are under bond, and the work is inspected by the city.

H. D. SMELSER,
City Engineer.

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Construction and Maintenance

Engineering and Highway Departments

Saving Farm Land from Erosion, with County Road Machinery

TO save farm land from erosion or washing away is so important that the Legislatures of Texas and Oklahoma recently passed laws authorizing county officials to permit landowners to use county road machinery, such as tractors and graders, to construct terraces on their properties, when the machines are not in use on road work.

In Texas, the farmer pays a reasonable rental for the machinery, while in Oklahoma he is required to pay only its operating cost.

Soil erosion is caused by the rapid movement of rainwater over the ground. Terracing has been found by the Bureau of Agricultural Engineering of the U. S. Department of Agriculture to be the most effective method of controlling the flow of water and thus preventing erosion.

According to a report made to the Bureau by A. K. Short, terracing specialist for the Federal Land Bank at Houston, Texas, who has been supervising the construction of a great many terraces with a 60-ton crawler tractor and a 12-foot road grader, terraces 22 feet wide and 20 inches high may be built on moderate slopes, in two rounds, for from 50 cents to $1.50 an acre. In stiff clay land, however, three rounds were frequently necessary to complete the terraces, increasing the cost by about 50 per cent. These costs are based on a charge of $40 per 8-hour day for the tractor and grader. Terraces may be built with heavy equipment at the rate of 2,000 feet an hour, and for less than one-third the cost of construction with smaller machines.

At the Federal soil erosion experiment reau by A. K. Short, terracing specialist ated by the U. S. Department of Agriculture in cooperation with the State Agricultural Experiment Station, terraces 25 feet wide and 18 inches high have been constructed with equipment similar to that used in Texas, at a cost of from $1.00 to $1.50 an acre.

Since soil losses from erosion occur in every state and in almost every county of every state, the Bureau believes that when more landowners realize the benefits of terracing, more states will pass laws to help combat this great waste.

LEWIS A. JONES,
Bureau of Agricultural Engineering, U. S. Department of Agriculture.

Minnesota More Than Doubled Its Surfaced Road Mileage in Nine Years

ACCORDING to a recent survey made by the U. S. Bureau of Public Roads, the state of Minnesota has 37,317 miles of surfaced roads of all classes, out of a total road mileage of 110,661. More miles of roads, both state and local, have been surfaced in the last nine years than in the entire previous history of the state, as an earlier report of the Bureau showed that on January 1, 1922, the state had only 16,905 miles of surfaced roads.

The survey shows that on January 1, 1931, there were 1,594 miles paved; 35,623 miles surfaced with macadam, gravel (including bituminous treated) or sand-clay; 2,304 miles graded and unsurfaced; and 71,139 miles unimproved or partly graded and unsurfaced.

The figures clearly show the effect of state participation in road building. Up to the time the first state aid plan went into effect in 1906, the state had practically nothing in the way of surfaced roads or other permanent results to show for 50 years of effort. Good progress was made under the state aid plan, but most of the state aid and county funds were spent in an effort to improve and maintain the main roads. The trunk highway plan, which went into effect in 1921, left those funds intact for use on secondary roads, and since then there has been rapid progress in the improvemen of all classes of roads.

C. M. BABCOCK,
State Commissioner of Highways.

Resurfacing One of the Main Streets of Dallas

SOUTH Akard Street in Dallas, Texas, is a main thoroughfare leading from the business section of the city to South Dallas. In 1908, this street, which had an average width of 35 feet with street-car tracks through the center, was paved with vitrified brick for a distance of 1.13 miles.

Traffic congestion finally became a serious problem and it was evident that the street, with the street-car tracks, was not wide enough to safely handle the increasing traffic. Plans were made to widen the street, and the street-car company decided to remove its tracks and use busses instead of street cars. Sufficient right-of-way was obtained from the property owners to widen the street to 50 feet.

Notwithstanding that the old street had given nearly 23 years of service, a careful inspection showed that a large percentage of the brick were still in good condition, sufficient to pave approximately 21,000 square yards. The brick were hauled to the Love Aviation Field and will be relaid on a combination apron and driveway.

Owing to the change in type of paving brick now being manufactured, it was decided that the street would have a better appearance if all surfaces and styles of brick were similar, so new brick were used in surfacing the widened street.

JOHN M. YOUNG,
City Engineer.

Keeping Cost Records for Street Maintenance

SOME sixteen years ago, when I started my work in University City, Mo., there was available for street maintenance only about $5,000 per year. For 1930, the appropriation was $50,000, and for 1931, $65,000.

During the first three or four years many complaints were received regarding the condition of the streets. However, after the work grew to a point that justified the employment of a street superintendent, a system of reports for the foremen were devised. These were turned into the office daily, and the items covering the amount of labor, the hours each piece of equipment was used on each street, and the amounts of materials used, were posted on a special ledger sheet for each street.

In about two years these efforts began to bear fruit, and when a taxpayer called up to complain of maintenance neglect, it was necessary only to consult the ledger to let him know just how much work had been done on his street and how much had been spent on maintenance there.

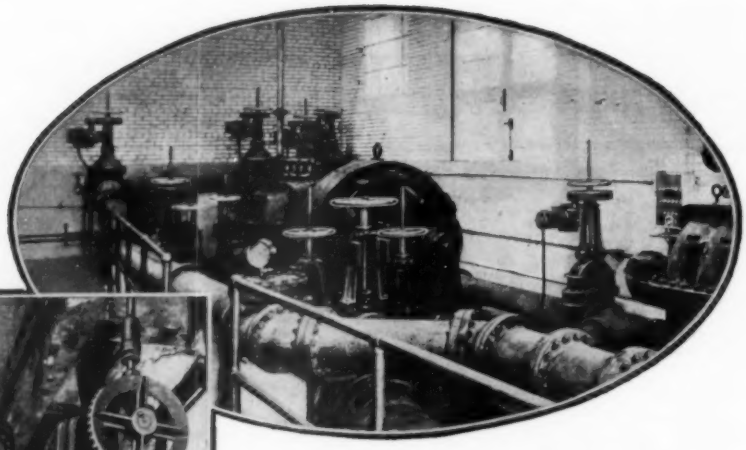
Another advantage is that it is possible to figure out just how much it costs to maintain each street and, when maintenance costs run too high, it is recommended to the Board of Aldermen that it is time to improve that particular street, and an improvement resolution is put through.

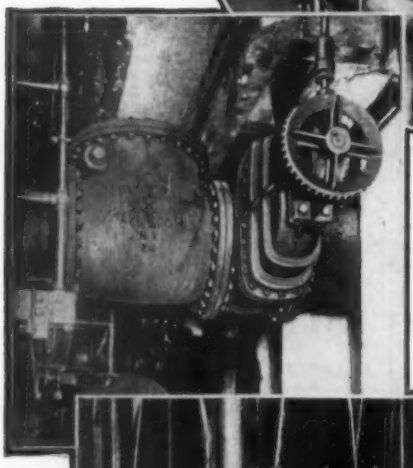
Street maintenance costs are of course not a very good basis for comparison, as a street which carries very heavy traffic will require more maintenance than another street of the same type which carries a lighter traffic. The width of the pavement is another factor that must be considered.

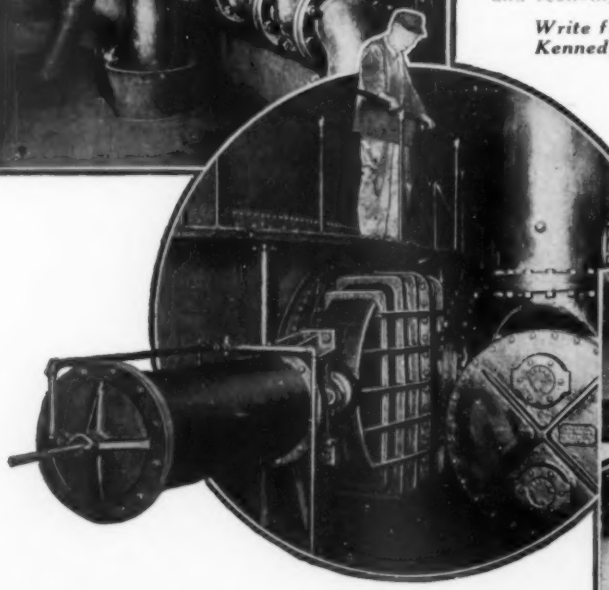
A man complained recently that we had done nothing on his street all the year. It was a cinder street and, by referring to the ledger, it was possible to show him that $300 had been spent on 900 feet of roadway. This was rather expensive, so he was told that that particular street was not due for any more maintenance until the coming year, which settled the argument.

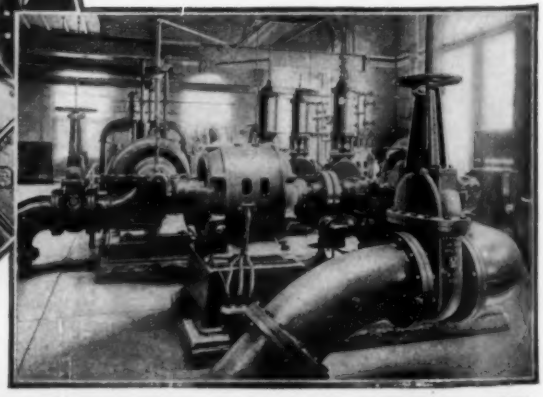
The foreman's daily report sheets show the labor, foreman's time, amounts and different kinds of material, and the hours use of each type of equipment. A fixed charge is also made for overhead. During the first two years we did not know what charge to make for the use of our equipment, so we kept a fairly accurate account of what our trucks and rollers were costing and have been using those figures since.

WALTER A. HEIMBUECHER,
City Engineer.









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KENNEDY Valve operation is always dependable

NOTICE the many different types of control in these views of typical Kennedy Valve installations. Electric gear, extended stem, hydraulic and manual control are all shown—**and in each case the service is thoroughly satisfactory.**

This is not merely because the controls alone have been carefully planned and adapted to the specific requirements of each installation, but further, because each Kennedy Valve itself is efficiently designed, honestly built, and ideally suited to the service for which it is offered.

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HARRY W. DAMEROW
Supt. of Public Works and City Engineer, Vero Beach, Fla.
(Appointed 1923)

J. Q. JUSTICE
County Road Engr., Pike Co.
Pikeville, Ky.
(Appointed 1930)

WILLIAM THOMAS HALL
City Engineer
Graham, N. C.
(Appointed 1924)

ROBERT L. MAYNARD
City Engineer
Asheville, N. C.
(Appointed 1931)

GEORGE E. HOPKINS
City Engineer
Longview, Wash.
(Appointed 1931)

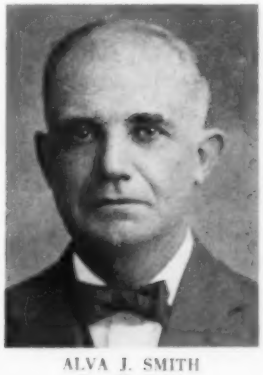
Who's Who in City & County Engineering

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

PETER F. DONEHUE
County Surveyor, Osage Co.
Linn, Mo.
(Appointed 1929)

W. A. RICHMOND
City Manager
San Leandro, Calif.
(Appointed 1928)

J. C. STEGNER
City Engineer
Newport, Wash.
(Appointed 1921)



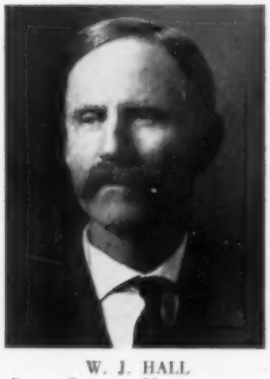
ALVA J. SMITH
City Engineer
La Verne, Calif.
(Appointed 1922)

CHARLES F. SAUNDERS
City Engineer
Hermosa Beach, Calif.
(Appointed 1928)

F. C. WILLIAMS
County Surveyor, Bath Co.
Millboro Springs, Va.
(Appointed 1918)

EDWARDS N. EAGER
City Engineer
Fairfield, Calif.
(Appointed 1916)

HARRY E. REDDICK
City Engineer
Santa Paula, Calif.
(Appointed 1918)



W. J. HALL
County Surveyor, Montgomery Co.
Christiansburg, Va.
(Appointed 1924)

McWANE pipe for "*tough spots*"

POSSIBLY you hadn't thought of it before—that time after time McWANE PIPE is picked for the *tough* places. Not because it is so heavy, but because it is so *strong*.

In the above case, it was selected because of its strength and because its Precalked Joints permitted installation of this 12-inch main between tides.

Ask us who is using McWane Pipe near you—then let *him* tell you why he likes it; why he continually reorders it.

WHY McWANE PIPE WINS

1. It is sand-cast.
2. Bell and Spigot type.
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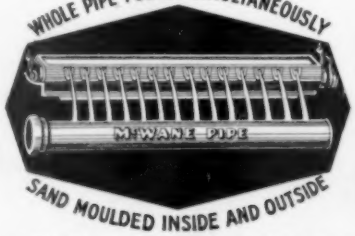
4. 16-foot lengths, above 3" size.
5. Over 30,000 lbs. tensile strength.
6. Over 2,600 lbs. transverse strength.
7. Modern in weights and uniformity.
8. Furnished either with or without Precalked Joints.

Sizes: 1¼ through 12 inches. Standard Lengths. Fittings.

McWANE CAST IRON PIPE CO. BIRMINGHAM ALABAMA



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NEW YORK, 40 Exchange Place
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CHICAGO, 208 S. LaSalle St.
LOS ANGELES, 417 S. Hill St.
KANSAS CITY, 1006 Grand Ave.
SAN FRANCISCO, 111 Sutter St.
SALT LAKE CITY, 149 W. 2nd South St.
DENVER, 226 Cont'l Oil Bldg.
PORTLAND, ORE., 611 Spalding Bldg.

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

No Rubbish Collection in New Haven

IN the majority of homes in New Haven, Conn., grass cuttings, leaves and branches are either burned or thrown on the ash heap to be removed later by a man hired for this purpose. The city does not remove ashes, rubbish or refuse from any residence, garbage as it comes from the pantry or kitchen being the only waste collected. If it happens that the garbage collectors find anything other than garbage in the cans, they refuse to remove the contents of the cans until rubbish and garbage are separated. The reason for this is that all garbage collected from hotels, restaurants and homes is taken direct to either the city piggery or the contractor's farm, where it is fed to hogs.

The city is divided into three districts, the city collecting garbage from one district, and the other two districts being let out to contractors who also have piggeries close to the outlying sections of the city. All garbage from the city route is collected twice a week by five auto trucks, removing an average of 13 tons a day.

The garbage collected by the city is taken to Springside, where the Almshouse is located. A veterinary is employed to care for the health of the pigs. There are five concrete platforms to receive the garbage as it is dumped from the trucks. Here it is carefully assorted and shoveled into pushtrucks, transferred to the various breeding houses and distributed about the stalls. During warm weather, the pigs are cleaned with a hose.

A typical daily report of the city piggery shows 104 sows, 24 boars, 441 shoats, and 584 sucklings, 14 sucklings bred, 2 pigs dead, and a total of 1,153 pigs at the farm. During June 43 sows, a total live weight of 11,800 pounds, were sold. There is no surplus garbage at any time.

There are four breeding houses at the farm. Two of these, which are 30 feet wide and 200 feet long, have 50 stalls each. The other two houses are 20 x 50 feet, and have 12 stalls and 26 stalls, respectively. All the houses have cement floors and drains. There are also 14 sleeping houses, consisting simply of side walls and roof, 15 x 15 feet.

ELIAS GLOUSKIN,
Chief Inspector of Garbage.

Jacksonville Will Soon Need Greater Disposal Facilities

FOR the purposes of refuse collection and disposal, the city of Jacksonville, Fla., is divided into six districts. In those areas adjacent to the incinerators, mule-drawn collection carts are used, while in other sections motor trucks are employed. Twelve trucks are used for garbage and rubbish collection, and five trucks are used for grass and combustible waste collection, two in Springfield, two in Riverside, and one downtown. Of the garbage trucks, three are used in the central business area for night collection. All residential collections are made during the daytime.

The city operates two dumping grounds for trash. All garbage is disposed of in five incinerators, which have a total combined rated capacity of 260 tons per day. The incinerator sites are conveniently located, so that few hauls exceed three miles in length.

According to the recorded collection figures, the maximum daily garbage production of the city, which, according to the 1930 Census, has a population of 129,549, approaches 300 tons daily, which exceeds the present incinerator capacity by nearly 25 per cent. From this, it would appear that an additional incinerator unit is required now and, further, that with every 50,000 increase in population an additional 100-ton unit should be installed. This would signify that a new 100-ton unit constructed during the next year or two should be followed by another about 1936.

As the city expands and its population becomes more widely scattered, more trucks will be necessary and new incinerator or disposal sites will be necessary. There can be a limited additional development at the present two sites, but, before many years elapse, the haulage distances will exceed the efficient and economical.

—From a city planning report by George W. Simons, Jr., Consulting Engineer.

Feeding of Garbage to Hogs Found Satisfactory in Moline

THE city of Moline, Ill., collects from 15 to 25 tons of garbage per day. This is hauled to the hog farm of the Tri-City Disposal Co., which is located three miles outside the city. Here from 800 to 1,500 hogs are fed per day. This has proved to be a very satisfactory method of handling the garbage of the city. The work is under the supervision of the Health Department.

The Street Department of the city has charge of the collection and disposal of grass, leaves, branches and twigs. Rubbish is picked up and disposed of at different dumps throughout the city.

A. C. STOUPFER,
Health Officer.

Refuse Disposal Figures for McKeesport

FROM January 1 to December 31, 1930, the city trucks and wagons operated by the Bureau of Sanitation of McKeesport, Pa., collected a total of 7,657 loads of mixed garbage and refuse; a total of 9,164 truckloads were delivered to the incinerator by private haulers; 2,478 loads of celery, fruits, vegetables, building construction waste, etc., were delivered by commission merchants and contractors, in private trucks; and 314 loads were delivered by the boroughs of Dravosburg, Versailles, Portvue and Glassport. This made a total of 19,613 loads of mixed garbage and refuse delivered to the incinerator for disposal during the year.

In addition, four old pianos, six old organs, 12,000 Christmas trees and 25 loads of old furniture were delivered to the incinerator, making a total of 24,200 tons for the year, or approximately 78 tons per day, based on 310 working days. The average daily tonnage for 1929 was 65. Dogs, cats, horses, cows, lambs, goats, ponies and gassed dogs from the dog pound to the number of 911 were received at the incinerator for cremation.

At the municipal dump city trucks and wagons delivered 738 loads of tin cans and 946 loads of ashes, and private haulers delivered 185 loads of tin cans and 2,208 loads of ashes. Miscellaneous materials consisting of tin roofing, old wire glass, 498 bed springs, rubbish, etc., were hauled to the dump in 317 loads by private haulers and 380 loads by the Bureau of Sanitation.

The garbage received from the boroughs mentioned above is disposed of at a service charge of 25 cents per cwt., according to a contract price fixed by the City Council.

L. G. REBER,
Supervisor, Bureau of Sanitation.

Grass Cuttings, etc., Collected with Ashes

IN Lewiston, Idaho, the collection of weeds, grass cuttings, leaves, twigs and branches, not to exceed the contents of a small receptacle, is taken care of by the ash collector, who is paid $295 per month by the city. He supplies his own man, gas and truck.

Leaves from all parking strips are taken care of by the Street Department at no cost to the property owner. Branches in the parking areas are taken care of in a like manner. However, all other refuse, leaves, twigs, etc., taken from private property must be disposed of by the property owners, who, as a rule, burn this trash in the alleys. This is more or less objectionable owing to fire hazard and smoke nuisance.

The manner of handling refuse of this type is not entirely satisfactory, but it is rather difficult to set a stated charge to take care of the disposal of leaves, grass cuttings, etc., from private property, on account of the difference in the areas involved.

W. P. HUGHES,
City Engineer.

DOUBLE EFFICIENCY

IT LOADS

IT THROWS

SNOGO

SIMPLIFYING
THE SNOW REMOVAL PROBLEM

LOADS The largest truck in 20 seconds—to 4 or 5 times its normal capacity • positive close range control with the loader hood • A clean job over to the curb • loads on the traffic side—no delay.

THROWS The snow into parks, parkways or vacant lots, over the sidewalk • saves the cost of hauling • the augers take any consistency of snow off the street—right down to the surface.

• SNOGO MEANS MORE SNOW REMOVAL •

KLAUER MANUFACTURING CO., DUBUQUE, IOWA

"Keep Your Streets Clean"

Items on Street Cleaning and Snow Removal

Second Installation of Uniform Street Sanitation Records

KENOSHA, WIS., was selected as the demonstration city in the 50,000 population class by the Committee on Uniform Street Sanitation Records, which has just completed the second of its demonstration installations in that city, the first system having been installed in Brunswick, Ga., which is in the 15,000 population class. This installation is described on pages 105-107 of the June, 1931, issue of THE AMERICAN CITY.

A complete manual of the Kenosha installation, together with the forms employed, is being prepared and distributed to 1,600 city officials throughout the country, with the recommendation that they adopt all appropriate portions in their respective cities.

Kenosha was selected because of the splendid administrative methods employed by P. J. Hurtgen, Director of Public Works, and William E. O'Brien, City Manager. The installation staff of the Committee found the Director of Finance, H. C. McLaughlin, to be maintaining one of the best, as well as one of the simplest, general accounting systems in the country and already submitting to department heads monthly statements which show the exact condition of each appropriation. Similarly, the purchasing system and central stores control, operated by the Purchasing Agent, J. V. Duffy, was found to be a model one and required no changes whatever in the installation. Kenosha also manages all of its equipment from a central garage, which aided in providing an effective system of equipment records.

The installation required approximately one month of the time of the Committee's staff, consisting of Donald C. Stone, the Director of the Committee, and G. A. Moe, Staff Cost Accountant, working in conjunction with the several city officials. During this period revisions were made in the daily field reports, equipment records, the cost records, complaint reports and monthly administrative statements, all of which resulted in a smoothly operating and well-balanced system.

I. A. P. W. O. Convention in New York City

THE Twelfth Conference of the International Association of Public Works Officials will be held at the Hotel Pennsylvania in New York City on September 24, 25 and 26, 1931.

The Conference will be opened in the Roof Garden of the hotel by President Elmer C. Goodwin. Dr. William Schroeder, Jr., Chairman, Sanitation Commission of New York City, will deliver the address of welcome. This will be followed by reports of the officials and discussions.

The morning of Friday will be occupied by business sessions, while the afternoon and evening will be devoted to entertainment. Busses will convey officials and their guests to City Hall, where they will be received by Mayor James J. Walker and then proceed to the Battery for a boat trip around the harbor. In the evening officials will be the guests of the Manufacturers Division at a dinner and entertainment, while the ladies of the conference will be entertained at dinner and the theater under the auspices of the Ladies Reception Committee.

The business sessions will continue on Saturday morning, after which officers will be elected.

The subjects to be discussed include a school for public officials, the organization of the Department of Sanitation of the City of New York, sewage disposal, taxation, snow removal, city planning, street lighting and municipal airports.

Operating Records for First Six Months of 1930 in Wichita

THE four motor sweepers operated by Wichita, Kans., were used a total of 334¾ days at a total expense cost of $7,185.26, or an average of $21.46 per day. This includes the cost of operation of sweepers, disposal of sweepings, labor and repairs on machines, broom fiber and wire, labor of making brooms, gasoline, oil and grease. Depreciation charges on the machines were not figured. The four machines picked up an estimated total of 6,953 cubic yards of sweepings, or an average of 20.77 cubic yards per day.

None of the sweepers are equipped with speedometers excepting the machine purchased in 1930. This machine operated a total of 97¼ days with a speedometer reading of 1,958 miles, or an average of 20.1 miles per day.

H. P. MUSICK,
Director of Public Service.

Courtesy of Alfred D. Schlosser, Second Deputy Commissioner, Department of Public Works, Albany

A HVASS FLUSHER IN OPERATION IN MARCH IN ALBANY, N. Y.

This photograph was taken the first day the flusher was out this year and some ice still remained at the curb line

PORT JERVIS *jumps* BOX ALARMS *from* 1% *to* 97%

The fire alarm system was designed entirely for emergency use such as fire alarms demand. It provides a QUICK and ACCURATE contact with the fire department.

CLEARY
CITY CLERK

CITY OF PORT JERVIS, N. Y.
CITY CLERK'S OFFICE

June 16, 1931.

The Gamewell Company,
Newton, Mass.

Gentlemen:

In reply to your inquiry of the 14th. inst., you are advised as follows:

1 Number of fire alarm boxes under old system was 12.

2 Percentage of box alarms received over period of two or three years before new system was installed was approximately 1%.

3 Number of fire alarm boxes under our new system, 66.

4 Percentage of box alarms received since installation of new system is approximately 97%.

5 Fire area is approximately 1550 acres.

Very truly yours,

City Clerk

The telephone was designed primarily for business and social communication, which purpose it serves very well. Because of the chances for disastrous delay in an emergency, the phone should not be used for transmitting fire alarms.

Since alarms received through fire alarm boxes are the only safe ones, it is naturally the object of every fire chief to maintain a high percentage of box alarms. Unless you install an adequate number of fire alarm boxes from year to year in order to keep in step with the growth of your city, it will be impossible for you to maintain the much desired high percentage of box alarms.

Naturally, if your city has no fire alarm boxes at all, it can receive no box alarms. If your city has only one-quarter or one-half of its requirements, it will receive only one-quarter or one-half of the box alarms that it should. That is simple logic.

The letter from Mr. J. F. Cleary, City Clerk of Port Jervis, N. Y., reproduced on this page offers practical evidence of this fact. By increasing the number of fire alarm boxes from 12 to 66, Port Jervis increased its box alarms from 1 per cent to 97 per cent. By increasing the fire alarm box distribution in your own city, you too can increase the percentage of your box alarms.

THE GAMEWELL COMPANY
NEWTON, MASSACHUSETTS
"A Box A Block"

FIRE — SAFETY — TRAFFIC

Items for Departments of Public Safety

Fire Prevention Week

FROM October 4 to 10 communities throughout the nation will give special attention to means of lowering America's gruesome and indefensible record of fire losses. The National Fire Protection Association, 60 Batterymarch St., Boston, has prepared various aids for the observance of Fire Protection Week, including a 50-page "Fire Prevention Week Handbook" (15 cents a copy), a supplement entitled "Facts About Fire" (5 cents), and a collection of photographs of fire prevention exhibits (10 cents). Posters and films are also available through the Association.

Fire protection activities offer an exceptional field for temporary employment that is in every way worth while. The undertaking of a thoroughgoing inspection program, as well as the removal of fire hazards, the replacement of combustible structures by those that are fire-resistent, and the improvement of fire protection facilities, will all yield big dividends for the future, and mean the establishment of procedures, habits and improved construction that will be of lasting benefit to the community.

There Should Be No Political Friend for the Traffic Offender

"ARE we to go on and on through life begging and pleading with irresponsible and reckless drivers not to maim or kill us and our children?" asked Mayor Leon Schwartz, of Mobile, Ala., in an address before the Pilot Club of that city as a feature of the Club's Safety Driving Campaign. Answering his own question, the Mayor said, "I say *No*, and that the way to curb careless and irresponsible driving is to bring every such offender—rich or poor, the influential as well as those without influence, *all*, without regard to class or color—into a court of law and justice, following the offense, and then and there mete out such punishment as will make the thoughtless and irresponsible driver remember it until his dying day.

"I speak of bringing *all* offenders into court, with the definite idea in mind that in this country of ours that is *not* being done. It is not uncommon practice, as we know, for a citizen who gets an 'arrest' ticket to consider at once what influence he can bring to bear to nullify the ticket which he holds and not go into court. In driving recently with a friend of mine in another city, this friend informed me that he could drive as he pleased and park as he pleased without fear of being tried, because the Mayor is his friend. I asked him if the Mayor was not a friend of all the other people in his city who might be run over because of this illegal license or favor being given by him."

Commenting on two traffic offenders who had appealed—in vain—to him as a political friend to help keep them out of court, the Mayor said:

"Consider these two types of citizens. The first one became angry because personal influence would not relieve him before reaching our court of justice where a law enforcement officer had assigned him; and the second one, who thoughtlessly, or in line with frequent custom, first thought to use friendship or influence, promptly declared that his friend in public office was right and that his proper course was to go into court and pay his fine if found guilty there. . . .

"Our English cousins, when they violate misdemeanor or high crime, must go into court, and there the case is settled. Establish that system in America, without fear or favor or modification, and a long step will have been taken towards the elimination of automobile accidents, and other crime."

Safety Work Among Municipal Employees in New York State

AN analysis and summary of the safety activities conducted by municipal employees in New York State cities, as indicated by questionnaires sent out to these cities by the New York State Bureau of Municipal Information, was recently made by the Safety Service Department of the Metropolitan Life Insurance Company. This summary is based on reports from the mayors, their secretaries, city clerks, city managers or chiefs of departments conducting any safety activities. Some cities conducted safety campaigns, consisting mainly of safety contests among the municipal employees.

Other safety activities included frequent inspections of machinery by the city officials, commissioners of public works, insurance company inspectors, departmental superintendents, and in some cases the operators or chief mechanics. Safety committees were also formed in some municipal departments.

The use of safety advertising tended to decrease the number of accidents appreciably, as the employees were educated in the ways and means of safeguarding themselves while at work. Safety advertising included the use of bulletins obtained from the insurance companies with which the departments were insured. Some departments have used posters furnished by the State Insurance Fund.

In a few cases municipal departments conduct employees' safety meetings and encourage them to attend meetings of instruction conducted by local safety councils and chambers of commerce. Safety measures, such as first aid, are taught in the police training schools, and both policemen and firemen were urged to attend Red Cross courses of instruction. In one city, whenever safety contests or safety meetings were held, several city employees of the public works plant attended and later reported the information they had secured, to group meetings of the employees of the plant.

E. D. GREENMAN.

Building and Plumbing Code Statistics

HOW many municipalities of 5,000 population and over in the United States have building codes and plumbing codes? When were these adopted? How many of these have become outmoded, and are now being, or recently have been, revised?

The Bureau of Standards, Division of Building and Housing, Department of Commerce, circularized the public officials of the country during April and May of this year for the purpose of answering these questions as it has answered them in past years. A summary of the replies shows that 88 cities have building codes and 82 have plumbing codes 20 years old, or older; 126 have building codes and 104 have plumbing codes from 15 to 20 years old; 162 have building codes and 97 have plumbing codes from 10 to 15 years old; 342 have building codes and 210 have plumbing codes from 5 to 10 years old; 419 have building codes and 324 have plumbing codes less than 5 years old.

Because of the general interest of municipal officials, material-producing associations and others in this field, and because of the value of the interchange of information among cities that are revising their codes, the Department has prepared a complete tabulation of the information collected for distribution to those interested. The details of principal code revisions are shown. (See department of Municipal and Civic Publications.)

Twinkle, Twinkle

TRAFFIC policemen in Paris are to have their hats illuminated with phosphorescent paint so that they may be seen by motorists on a dark night. "Not a bad idea," says the *Christian Science Monitor*. "Why not equip the hats with three different colors and utilize them for stop-and-go signals?" The vari-color idea might at the same time prevent the officers from being run down as lightning bugs.

This fire alarm system sends its messages in typewritten form

Here is a fire alarm system that will enable your central office operator to flash a box number to any one station, to any group of stations or simultaneously to *all* stations in less than two seconds. Or it will permit him to transmit the exact address of a still alarm and have it recorded in legible typewritten form.

Called Teletype, it prints its messages in a continuous line on a narrow paper tape which can be torn off and carried by the driver. It operates just like a typewriter and has a capacity of 370 letters or figures per minute . . . a speed sufficient to allow of sending a still alarm like that shown above in about seven seconds' time.

Teletypes to the number of 65,000 are now being used by police departments, railroads, air lines, telegraph companies, press associations and others requiring a speedy and accurate means of communication. Fully 1,250,000 miles of circuit . . . enough to reach 50 times 'round the earth . . . are employed in their operation. For further information consult your local telephone company or write the Teletype Corporation, 1400 Wrightwood Avenue, Chicago, U. S. A.

TELETYPE

SUBSIDIARY OF

Western Electric Company

TELETYPEWRITER SERVICE

GEORGE C. MAROHN
Police Chief
Tonawanda, N. Y.
(Appointed 1928)

HERBERT L. LABARGE
Police Chief
Potsdam, N. Y.
(Appointed 1929)

W. F. MARSHALL
Police Chief
Ithaca, N. Y.
(Appointed 1916)

AUSTIN J. ROCHE
Commissioner of Police
Buffalo, N. Y.
(Appointed 1930)

JOHN H. ESPEY
Fire Chief
Elmira, N. Y.
(Appointed 1904)

Who's Who in Public Safety

The 43rd of a Series of Portraits of Fire and Police Chiefs Which Has Appeared Monthly Since January, 1928

ANDREW J. CORCORAN
Police Chief
Greenwich, N. Y.
(Appointed 1921)

C. H. LAWTON
Fire Chief
Greene, N. Y.
(Appointed 1927)

GERALD K. NELLIS
Police Chief
St. Johnsville, N. Y.
(Appointed 1923)

C. G. ZEPPERIAN
Fire Chief
Sea Cliff, N. Y.
(Appointed 1930)

HARRY B. PAGE
Fire Chief
East Haven, Conn.
(Appointed 1904)

H. DONALD McCOLL
Police Chief
Nunda, N. Y.
(Appointed 1928)

LEWIS N. SPRING
Police Chief
Warsaw, N. Y.
(Appointed 1929)

WILLIAM GILMAN
Police Chief
Buchanan, N. Y.
(Appointed 1929)

PETER BECKERLE
Fire Chief
Danbury, Conn.
(Appointed 1916)

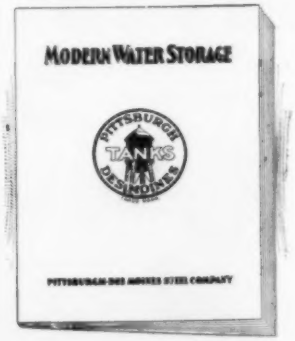
PITTSBURGH DES MOINES

Any question about Water

"Pittsburgh-Des Moines" has been supplying American municapilities with modern water systems, including the latest improved equipment and accessories, for over 38 years. Write or wire our nearest office for a proposal to take care of your particular water supply problem.

Just Off the Press—Write for Your Copy!

"Modern Water Storage" our new 28-page catalog in convenient file size, is now ready for interested municipal and industrial officials—or others contemplating the installation of an up-to-date water system. It gives reliable information, interesting photographs, and authentic engineering data and specifications on the various types of "Pittsburgh-Des Moines" elevated tanks, standpipes, steel reservoirs, treating plants, and complete water systems. Our nearest office will cheerfully supply your copy.



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SEPTEMBER, 1931

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Certain Acute Problems of Police Departments

And Suggestions for Their Correction by the National Commission on Law Observance and Enforcement

SOME self-restraint will be required of many of THE AMERICAN CITY'S *readers for a dispassionate study of the Report on Police* released from the White House last month on behalf of the National Commission on Law Observance and Enforcement. The opening paragraph, for example, states that "the general failure of the police to detect and arrest criminals guilty of the many murders, spectacular bank, pay-roll, and other hold-ups, and sensational robberies with guns, frequently resulting in the death of the robbed victim, has caused a loss of public confidence in the police of our country."*

But assuming that George W. Wickersham and his associates on the Commission who signed the report, would make numerous exceptions to this general indictment of our police departments, and assuming a desire of municipal officials and chiefs of police to improve the public safety and the administration of justice in their respective cities, the report under discussion contains much that is constructive and helpful.

The accompanying excerpts are from the statement of the Commission transmitting the report, and from the Summary and Conclusions of the document itself—the latter being the work of David G. Monroe and Earle W. Garrett, Research Assistants of the Department of Political Science of the University of Chicago, serving under the direction of August Vollmer, Professor of Police Administration of the University of Chicago.

1.

The chief evil, in our opinion, lies in the insecure, short term of service of the chief or executive head of the police force and in his being subject while in office to the control by politicians in the discharge of his duties. A questionnaire was sent out under the authority of this commission to the officials of 745 cities, to ascertain the length of service of the head of the police force in each city, and replies received from 575 cities, ranging in population from 10,000 to those over 500,000, showed that the average term of service in any of the classifications is considerably less than five years. In 9 cities having a population of from 300,000 to 500,000 the average service of the chief is but 3.62 years, while in 10 cities having a population of 500,000 and over, the average service of the chief is a mere 2.41 years. In one of our great cities there were 14 chiefs of Police in 30 years.

Such brief term of the chief is invariably followed, upon his dismissal or resignation, by a more or less general shake-up of the subordinates from captains and detectives to patrolmen.

It goes without saying that corporate business of any magnitude conducted on such short terms of service by its executive officials and responsible subordinates would have restless, worried and inefficient employees and the corporation would soon find itself bankrupt. . . .

We have . . . as [other] outstanding causes of inefficient police administration by the executive, . . . his control by the politicans, whether linked in alliance with the criminals or not, in his appointment and conduct of the office; his lack of independence; and frequently his incompetence for the place. . . .

2.

The second outstanding evil of such poor police administration is the lack of competent, efficient, and honest patrolmen and subordinate officers. The latter are, with rare exceptions, selected or promoted from the rank and file of the patrolmen, possibly by reason of seniority, but more likely by direction of politicians whose private interests are to be subserved. Even where there are civil service examinations, the hand of the politician is all too plainly visible in such promotions. . . .

3.

The third great defect of our police administration is the lack of efficient communication systems whereby intelligence of the commission of a crime and descriptions of the criminals may be quickly spread over a wide territory, and as part of that, the necessary equipment in motors to pursue traces of the criminals making their escape. . . .

4.

The well-known and often proven alliance between criminals and corrupt politicians which controls, in part,

* See department of Municipal and Civic Publications.

at least, where it does not wholly do so, the police force of our large cities, might well be taken as a primary cause of police inefficiency, since it rules the head and every subordinate, and lays a paralyzing hand upon determined action against such major criminals. . . .

5.

But the inefficiency of our police in failing to detect, arrest, and prosecute the gang criminals cannot all be laid to inefficient equipment, incompetency, and corrupt politics. The excessively rapid growth of our cities in the past half-century, together with the incoming of so many millions of immigrants, ignorant of our language, laws, and customs . . . has immensely increased the difficulties of the police in detecting crime among the foreign-born. . . . Added to the difficulties concerning the foreign-born, the influx of large numbers of Negroes to our northern cities has measurably added to the difficulties of police administration.

6.

There are too many duties cast upon each officer and patrolman. . . . As the urban population increased, no diversification was made in the duties of officers and patrolmen. . . . The recent complete survey of the Chicago police, made by competent experts and published under a citizens' committee, has graphically set forth such a division of duties and coordinated responsibility to the chief.

The Commission's Suggestions Summarized

The failure of police departments throughout the United States to provide adequate patrol in all sections of their respective communities is due in part to the multiplication of duties with which they are charged. Traffic problems have steadily increased with the growth of the automobile industry, requiring more and more officers for traffic duty. Vice, gambling, liquor and narcotic problems of the most complex variety absorb the time of many men. Yet we take men of mediocre caliber without training or special ability and charge them with responsibility for solving these intricate problems.

Legislatures have massed unenforceable laws upon the statute books which only serve to bring the police into disrepute with the people when they attempt to do their sworn duty. The absence of scientific principles of administration results in great disparities among the police organizations of the country. The general incompetence of chiefs themselves is due to the American custom of entrusting the office to most any average person. Even persons of superior ability in other lines of work have failed to make satisfactory records as police administrations. The difficult problems of the police demand expert ability of a high order in any directing head. . . .

The handling of groups whose attitude toward the Government may differ radically from the average requires a well-advised technique. . . . A clear knowledge of the law must be at the command of the policeman; he cannot guess, he must know. He is personally liable for his mistakes. . . .

An executive must qualify as one who knows the secret ways of politics, criminals, and human nature if he is to enjoy large success. He must know the pressure groups, their objectives and their tools. He must know his men and how to recognize merit. His policies must prevail over long periods of time to be really fruitful.

The selection of a police executive should be a matter of infinite care. Competence alone should be the criterion and, while experience in actual police service seems most likely to give the best preparation, suitable material should be sought wherever available. The intricacies of police work make it possible for the unwary outsider, as chief, to pledge himself to policies which are directly against the interests of society. . . .

The police recruit must be a man of intelligence and ability to successfully discharge the duties placed upon him. He must be honest and healthy to resist temptation and disease. . . .

A patrolman should be young enough to learn his duties easily and have no police record of serious offenses. He should be able to furnish satisfactory character references. In turn, his pay, working hours, vacation, days off, sick leave, accident provision, and pension should be fair and just.

Signal systems are of great importance and should be as modern as the community can afford. Call boxes, recall signal devices, telephones, teletype, and radio offer all that can be desired in communication systems.

The training offered, except in a very small number of cities, is negligible. A means of giving the policeman, in the small city as well as the large, proper training, must be adopted. State-wide supervision of police schools, employment of the zone system, the establishment of standards of instruction and curriculum must inevitably be adopted if our police systems are to cope with crime conditions today.

Records should be kept of all significant police work for the purpose of reference, control, and formation of strategic plans. Uniformity should be attained in order that results may be made comparable. The future of effective police work is even more dependent on reliable records than the present. . . .

The efficient operation of a state police force is recognized, especially in rural areas. The inadequacy of the sheriff-constable system is obvious and the need for a central state agency for the clearing of police information, and the development of a police consciousness in the schools is stressed.

Conclusions Reached in the Report

1. The corrupting influence of politics should be removed from the police organization.

2. The head of the department should be selected at large for competence, a leader, preferably a man of considerable police experience, and removable from office only after preferment of charges and a public hearing.

3. Patrolmen should be able to rate a "B" on the Alpha test, be able-bodied and of good character, weigh 150 pounds, measure 5 feet, 9 inches tall, and be between 21 and 31 years of age. These requirements may be disregarded by the chief for good and sufficient reasons.

4. Salaries should permit decent living standards, housing should be adequate, eight hours of work, one day off weekly, annual vacation, fair sick leave with pay, just accident and death benefit when in performance of duty, reasonable pension provisions on an actuarial basis.

5. Adequate training for recruits, officers, and those already on the roll is imperative.

6. The communication system should provide for call boxes, telephone, recall system, and (in appropriate circumstances) teletype and radio.

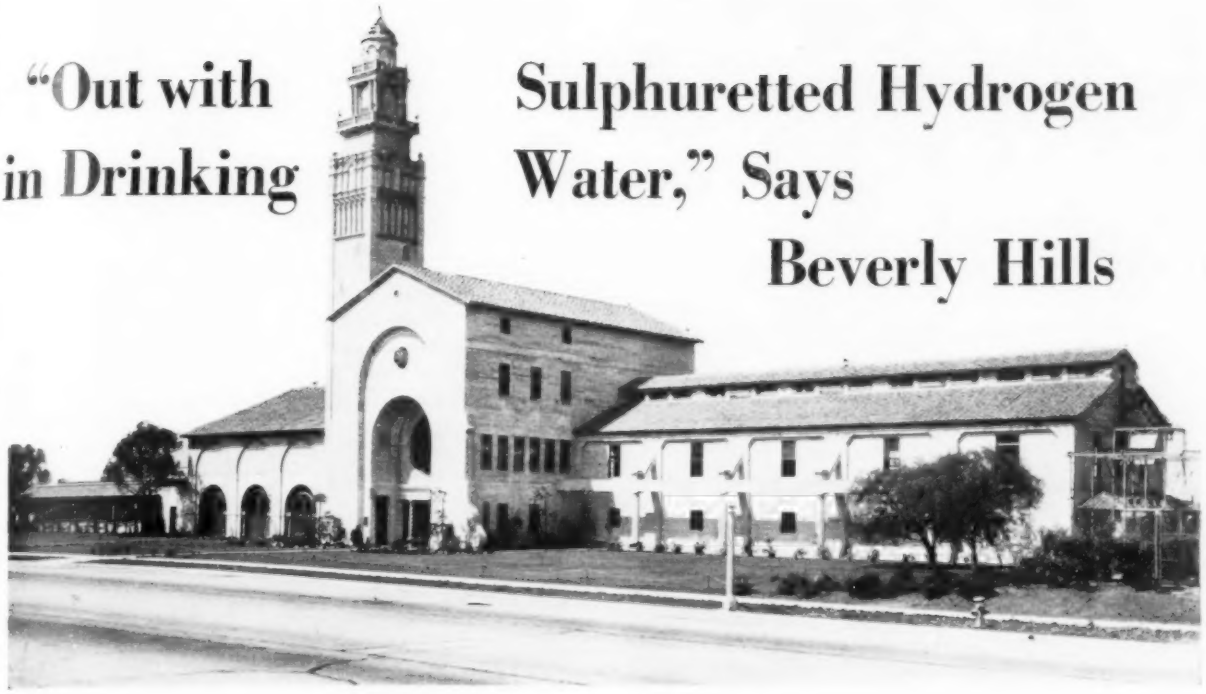
7. Records should be complete, adequate, but as simple as possible. They should be used to secure administrative control of investigations and of department units in the interest of efficiency.

8. A crime-prevention unit should be established if circumstances warrant this action, and qualified women police should be engaged to handle juvenile delinquents' and women's cases.

9. State police forces should be established in states where rural protection of this character is required.

10. State bureaus of criminal investigation and information should be established in every state.

"Out with Sulphuretted Hydrogen in Drinking Water," Says Beverly Hills



By **ARTHUR TAYLOR, M., Am. Soc. C. E.**
Salisbury, Bradshaw & Taylor,
Consulting Engineers, Los Angeles

LEGALLY, under California law, Beverly Hills is a city of the sixth class, but in the minds of its inhabitants and of many others it is a city of the first class, qualitatively speaking. Its population of 19,000 covers 3,000 acres. Its importance lies more in its ratio of assessed valuation per square mile to that of other California cities. For instance, its assessed valuation per square mile is virtually four times either that of Los Angeles or the average of other nearby cities.

The city was carefully and definitely restricted by the original subdividers. These restrictions are zealously guarded by the City Council, as is the well-planned zoning law. For these reasons, it is a highly desirable residential community. The type of development is generally in large lots and is profusely landscaped, which results in an extraordinarily high water duty per capita. With the average of Southern California cities at 125 gallons per day, Beverly Hills uses nearly twice that amount.

History of the Water Supply

In 1922 and 1923 the city registered decided growing pains. It was rapidly outstripping its water supply, which was from a few wells in one of the foothill canyons above the city. It was necessary to put in use some wells in the large valley at the lower end of the city to meet the increased demand. This supply was highly sulphuretted. The same is true of practically all the water underlying the detrital slope and in the valleys below the hills back of the city.

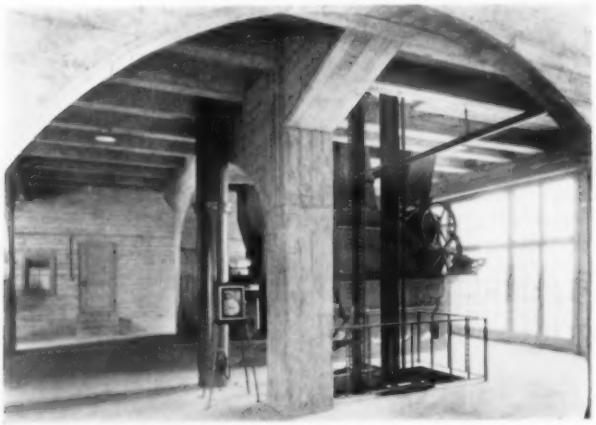
Treatment of the major portion of this supply was not a problem of water purity, bacteriologically speaking, but rather of trouble-fixing. The hydrogen sulphide content ran as high as 16 parts per million, along with considerable iron. Aeration liberates the greater part of the hydrogen sulphide, and the water immediately after aeration generally is perfectly palatable, but, unfortunately, the free sulphur and some of its compounds remain in the water. These two elements, iron and sulphur, persisted in being attended by their respective micro-plant-organisms, crenothrix and beggiatoa. Simple, inexpensive, preliminary treatment, such as aeration and algicide applications, could only partly curb these little pests. With the food supply, iron and sulphur, still in the water, the cycle of life throughout the distribution system was maintained. Copper sulphate dosages to wells were applied and somewhat retarded the growth, but that well-known compound was precluded from use in the reservoirs because of the brown color reaction it has on sulphuretted waters. Sodium peroxide proved a fair aid in reducing organic growths, but nothing but chlorine was really effective in controlling the growth in the mains.

Astonishing as it may sound, up to 100 pounds of chlorine were applied per million gallons daily into the transmission main as it left the aerator. As the chlorine reacted on the growths in the main, it was several weeks before residual chlorine was detected in the services, one-half mile from the pumps. As the mains cleaned up, of course, the dosage was gradually lessened.

All that was done in those days was to control by every practical inexpensive means the iron and sulphur and the resultant biologic manifestations. That was not a cure. By 1926, Beverly Hills justly felt that it was destined to grow. The Council authorized an expenditure of $6,000 for an experimental filtration plant and the engineers came to the conclusion that the possible alternative of a filtration plant with prolonged retention by very large

THE CHEMICAL STORAGE ROOM
Overhead there are two 70,000-gallon reinforced concrete wash-water tanks plastered inside with Gunite for waterproofing

reservoirs would not be entirely curative. It is felt that money is well spent on an experimental plant where the waters to be treated come from various sources and are of various characteristics chemically and biologically. The Beverly Hills experimental plant was a remarkable guide in determining the proper routing, proportioning, chemical mixing, retention periods and many of the variable factors which attend water purification and softening. It proves theories and disapproves some, but it is my firm belief that a plant designed to simulate the selected set-up



THE SECOND FLOOR CHEMICAL MIXING APPARATUS AND BELT CONVEYOR FOR CARRYING CHEMICALS FOR TREATMENT OF WATER TO THE FLOOR ABOVE

of a successful experimental plant will be the economic one and the savings will be many-fold the cost of the experimental plant. In the case of the Beverly Hills plant, the full-size unit was found to function exactly as designed for and, as predetermined by, the operation of the experimental plant.

The correction of tastes and odors was the first issue in Beverly Hills. The water problem at that time was the skeleton in the closet, but filtration and the correction of turbidity, tastes and odors, presented the opportunity for softening which entailed only a minor additional first cost and adds only ¾-cent per 100 cubic feet to operation costs for reducing the hardness 130 parts per million.

The New Plant

The selection of a site for the new plant was very limited. The city owned 22 acres on both sides of La Cienega Boulevard and assigned the west side to the Water Department. This acreage was purchased in 1922 for a sewage disposal works, but, as the neighborhood boiled over with protests, the city of Los Angeles came to agreeable terms for Beverly's connection to the outfall sewer. Foreseeing protest again, the Council gave one instruction to the engineers: "Build something that won't look commercial or like a water works." The completed plant is the answer, and this is the secret of its design: Some years ago, I had occasion to visit the great Terrazas ranches of Mexico and I took the design for the water works from the hacienda group. On each ranch is a casa grande, the house of the master. It is usually flanked by a towered chapel on one side and a protected granary on the other, with a continuour row of walled-in dwellings surrounding. Despite an occasional accusation of extravagance, it is believed that

THE 60-FOOT DORR CLARIFIER IN THE FOREGROUND, AND THE SEDIMENTATION BASIN IN THE REAR, WITH THE AERATING ROOM TO THE RIGHT

we did camouflage the treatment plant, which, as well, carries off great volumes of obnoxious sulphur gas via the 130-foot tower without much evidence of its real function.

The plant was designed for an ultimate capacity of 10,000,000 gallons daily, based on filter sand area allowing 2 gallons per square foot. Practically all the elements for that capacity have been built, with the exception of the filters and filter piping, which are only of half normal capacity. Since the second set of sedimentation basins were installed in January, 1931, it has been found that a flow up to 3 gallons per square foot on the filters produces an effluent practically as efficiently treated as at the normal rate, with half the retention capacity previously

THE FILTER GALLERY
This unique structure is supported by three-arch rib roofs supported by buttresses outside the structure. The roof is covered with hand-made tile, and is very attractive in appearance

available. Thus, for the nature of the water applied and the degree of softening amounting to 50 per cent reduction, the plant in its present state is virtually of 7,500,000 gallons daily capacity.

Sources of Water and Aeration

The water treated comes from two sources. A certain group of wells that do not contain sulphur empty their supply into a sand trap and flume extending across the higher side of the aerating room, pouring over a weir 60 feet long onto the floor, where it thins out over an area of 5,000 square feet before emptying into the flume leading to the primary mixing chambers.

The water from sulphuretted wells discharges through 70 Sacramento type spray nozzles on the risers from the rectilinear piping on the floor of the chamber and mingles with the other water supply on the floor. Extensive experiments were carried on with many types of spray nozzles. This type proved the most efficient for use in Beverly Hills, as regards low pressure losses, even distribution and film dispersement of the water—a very important factor in the liberation of hydrogen sulphide gas. This influent with gas up to 6 to 8 parts per million is reduced to 2.5 to 3 parts per million by the spray. The additional retention of the thin sheet of water trickling over the floor of the chamber further reduces the gas content to about 1.5 parts per million. Sedimentation takes out the remainder of the sulphur with the exception of a small residual which chlorine ahead of the filters cleans out entirely.

Sedimentation

From the aerator flume the water enters the primary mixing chambers, four cylinders in series, 12 feet in diameter and 21.5 feet deep. Agitation is created by Langelier type paddles which are motor driven by multi-speed gears and shafting. The paddles travel at from 13 to 20 r.p.m. The first of these four agitating tanks is the point of application for lime and two-thirds of the alum dosage. In the first few months of operation, various points of application of chemicals were tried out to determine the best and most efficient reaction.

Passing from the top of one tank to the bottom of the next and so on, the continuously agitated mixture finally enters the 60-foot Dorr clarifier and from there by flume goes to the secondary mixing chambers, which are identical with the first set. The remaining one-third alum dosage is applied there. The flow thenceforth is through the south sedimentation chamber into the north pair and by flue to the filters. The development of uniform flow through the basins is in part regulated by the control of the portals at the entrance.

The retention periods for a 5-million-gallon daily flow are as follows: primary agitators, 20 minutes; Dorr clarifier, one hour; secondary agitators, 20 minutes; sedimentation basins, 10 hours; a total of 11 hours, 40 minutes. For the 7½-million-gallon daily flow, the present operation is 8 hours, 45 minutes, apparently ample for treatment of this type of water and the degree of softening. At the ultimate capacity of 10 million gallons daily, the retention will be 5 hours, 50 minutes.

Chemical Results

For 1929-30, the average hardness of the influent as calcium carbonate was 242, which was reduced to 147, or approximately 40 per cent softening. At times the reduction has been increased to 50 per cent. The average treatment has been 7 grains of lime per gallon. This figures that each grain per gallon of lime reduces the hardness 13.43 parts per million.

Construction

The construction of this plant was let in three contracts. Concrete piling under the parts of the structure which overlie an old slough was awarded for $14,000. The general contract was $154,000 and the equipment installation contract, $45,000, with $6,000 set aside for landscaping. Early in 1931, the second sedimentation basin was built, for $15,000, making the total cost $228,000.

The Raymond Concrete Pile Co. was the contractor for the pile footings; Carpenter Brothers, Inc., the general contractors; and the California Filter Co., contractors for the equipment.

The plant was put in operation in May, 1928. Its operation has been continuous from the first day, except for two annual winter shut-downs of about ten days for rehabilitation of the filter beds and sand and miscellaneous clean-ups of the mixing tanks, basins, etc.

Benefits from the New Plant

The municipality has benefited greatly from the water at the new plant. The improved water, from the standpoint of rectifying turbidity, tastes and odors, brought about a better spirit, a better morale, so to speak, in the citizenry. The closet door was opened and no longer was the old sulphuretted skeleton there. The financial saving to the city, while it was costing less than 2 cents per 100 cubic feet for treatment, and is now nearer 1.8 cents, amounted to $28,000 per year alone in decreased bottled purchases by consumers. An interesting census taken before the plant was in operation and one year after it had been started showed a saving of some $54,000 per year. A survey showed that many restaurants and soda fountains had done away with their filters and softeners and, in addition, many home owners had dispensed with domestic softeners and filters. A theoretic calculation of soap saving alone shows a financial saving equal to the treatment cost.

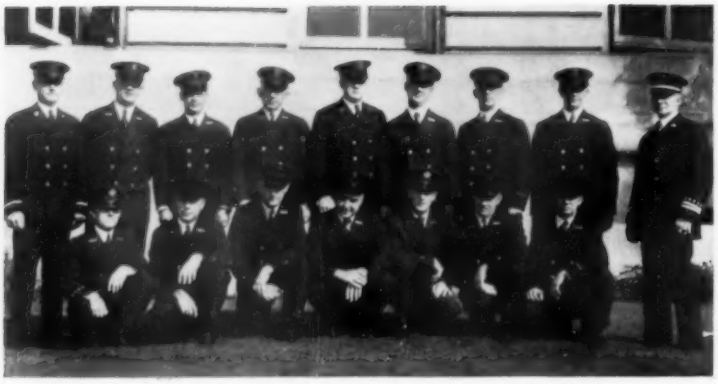
Unfortunately, the plant treats only about 80 per cent of the total water supply. The harder waters of the remaining untreated portion bring in some complaints, but upon completion of plant No. 2 now under construction and a thorough cleaning of the mains, the entire water supply of Beverly Hills will be softened and filtered.

Another interesting angle is that the plant cost is virtually only one-tenth the investment in the entire system, and treatment costs are only about one-seventh the selling price of the water.

ACKNOWLEDGMENT.—The photographs are reproduced through the courtesy of the author, and the text through the cooperation of the Pittsburgh Equitable Meter Co.

TEXAS CITIES FORESTALL FIRES

SIXTY towns and cities in Texas now have permanent fire prevention committees, according to a statement issued by the State Fire Insurance Commissioner, J. W. DeWeese. Mr. DeWeese declares that the steady increase in the insured fire losses in Texas for 1930 shows that the largest gain, according to the classification, was in dwellings, boarding-houses and apartments, and that in his opinion, the only way to reduce losses in this class is through programs of education. He urges a fire prevention board for every city.



THESE MEN TAKE A VITAL INTEREST IN SAN FRANCISCO'S FIRE PREVENTION WORK

At the left is the author. At the right is Charles J. Brennan, Chief, San Francisco Fire Department, Chairman, Advisory Board, Fire Prevention Committee, Member Executive Committee, San Francisco Fire Council. The group view shows the Bureau of Fire Prevention and Public Safety, San Francisco Fire Department, Capt. Theodore Trivett (right) in charge

Helping to Prevent Fires in San Francisco

By **THOMAS LARKE, JR.**
First Chairman, Fire Prevention Committee, San Francisco Junior Chamber of Commerce

TOO often conscientious municipal officials who are struggling to improve the standard of service to their communities are hampered by the indifference of taxpayers who, through lack of knowledge of the problems involved, fail to appreciate that they are the ones who will suffer by inferior service.

Fire Prevention Committee Formed

When the Fire Prevention Committee of the San Francisco Junior Chamber of Commerce was organized, four years ago, we were told that neither the city officials nor the public generally would support our activities. The officers of our organization, which is composed of the younger business and professional men of the city, decided, nevertheless, to see what could be done, and appointed a permanent Fire Prevention Committee.

The Committee proceeded to gather together all the available technical information on the local situation regarding fire prevention, fire protection, hazards, conflagration probabilities and the like. A natural consequence of this was the formation of the Fire Prevention Advisory Board consisting of officers of the San Francisco Fire Department, the Police Chief, the Fire Marshal, the Coroner, the Building Inspector, Engineers of the National Board of Fire Underwriters and the Board of Fire Underwriters of the Pacific, and local members of the National Fire Protection Association.

Among other facts developed by this study, which was carried on for nearly a year before any definite projects were decided upon, were these:

The number of fires breaking out in the city was increasing at an average rate of over 10 per cent each year, and was then considerably in excess of the per capita fire rate of most other American cities of large size.

The powerful and efficient Fire Department was being relied upon to keep down the losses of life and property due to fire, and the general consensus of opinion was that nothing more need be done.

The Committee's Platform

Fire officials realized that the situation was growing worse, but they could gain no support for corrective measures. After many discussions, conferences, visits to other Pacific Coast cities, and study of the available data, we decided to formulate a platform of future accomplishment by the Committee. All of the ideas were submitted, before final adoption, to the Advisory Board—composed largely of Fire Department officials—and, in fact, most of them were presented to the Committee by the Board through its chairman, Fire Chief Charles J. Brennan. The function of our Committee was to sell the idea to the city fathers that these projects were important and should be carried out. An outline of the "planks" in this platform, together with the results to date, follows:

(1) THE FIRE PREVENTION BUREAU

This important part of the San Francisco Fire Department was composed of three men, whose work consisted almostly entirely of running down complaints. With a total personnel of over 1,200 engaged in fighting fire, we felt that a greater number should be assigned to prevention work. Today the Bureau has eighteen permanent members, including a captain in charge and two lieutenants. All were carefully selected and trained, and the character of service rendered by this group of conscientious firemen is indicated not only by the many thousands of hazardous conditions eliminated, with hardly any arrests made, but by the fact that the number of fires in San Francisco is no longer increasing each year, but has actually been reduced.

(2) RESPONSE TO TELEPHONE ALARMS

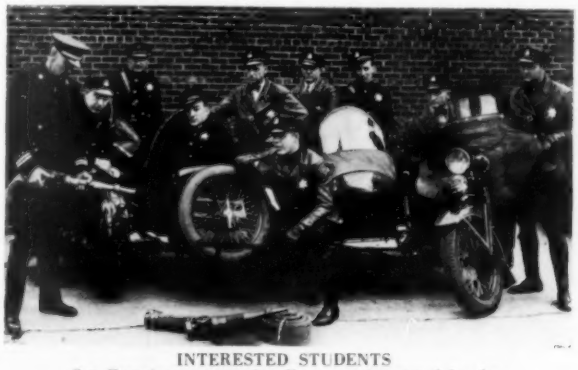
The practice of sending only the nearest fire company in response to a telephoned alarm of fire has been discontinued, and now a telephone alarm for a fire in a building results in the same response as though a fire-alarm box were operated. Prompt arrival of an adequate number of fire companies has in several instances averted what might have been serious fires. After all, if there is a fire, and the fire department knows it, why should the *means* of transmitting that knowledge to them determine the response of apparatus?

(3) INSPECTIONS BY COMPANY OFFICERS

Captains and lieutenants of the 65 engine and ladder companies now spend one full day of every two weeks inspecting buildings in their districts to which they are the first "due," for the purpose of familiarizing themselves with the construction, arrangement and occupancy. Reports, including diagrams showing stairways, elevator shafts, light wells, standpipes, exposures, etc., are sent by them to their battalion chiefs. Serious fire hazards are reported to the Fire Prevention Bureau for correction.

(4) COORDINATION OF FIRE PREVENTION EFFORT

In our initial survey, we found that several of the city departments dabbled in the enforcement of the fire ordinances or other laws which related to fire. This has now been corrected by the enactment of a Fire Prevention Ordinance, centralizing authority and responsibility in the Fire Prevention Bureau, and creating an Advisory Board, consisting of the heads of the other city departments affected. Instead of conflict of authority and bickering, there is now a means provided for cooperation, while a Board of Appeals provides an inexpensive method to be used by the citizen who feels that an order of the Bureau is unjust.



INTERESTED STUDENTS
San Francisco motorcycle officers are instructed by the Fire Department drill master in fire fighting

(5) FIRE COLLEGE FOR OFFICERS

Modern fire fighting involves knowledge of many technical subjects formerly thought beyond the ken of firemen, but other cities, notably Los Angeles, have demonstrated that efficiency in extinguishing fires should not be acquired by individual experience alone. The experience of the oldest "smoke eater" can, by means of a fire college, be made available to the youngest probationer. Plans for such a college are well under way in San Francisco.

(6) AERIAL LADDER TRUCKS

Owing to the many hills in San Francisco and to the existence in some sections of overhead wires, so-called "aerial" ladder trucks were not used. The longest ladders available were 65 feet, and raised by hand. We now have one 85-foot quick-raising aerial truck in service, and hope to have another this year. They are invaluable for rescue work, and we have demonstrated that they may be used successfully on grades, within certain limitations.

(7) EXTENSION OF THE HIGH-PRESSURE SYSTEM

On account of the growth of the city, certain districts which are protected by the high-pressure system are now badly exposed by districts of solidly built frame construction, thus weakening the effectiveness of the high-pressure system as insurance against another conflagration. So far, we have been unable to arouse public sentiment for extension of the system to the extent of securing an appropriation for the million-and-a-half dollars required.

(8) PROTECTION OF THE WATERFRONT

One of San Francisco's greatest commercial assets is its system of piers and wharves, but, like many other communities, it has neglected the protection of these long frame sheds, extending on piles over the water and at best a difficult problem of fire fighting. Although fires on the docks are extinguished by the San Francisco Fire Department, they are owned and controlled by the state of California, and our problem is therefore complicated.

Fortunately, the newly appointed President of the State Board of Harbor Commissioners, Honorable P. W. Meherin, is a former fire commissioner of San Francisco, who as such gave his whole-hearted support to the Junior Chamber of Commerce and its fire prevention program. He has already caused fire conditions along the waterfront to be considerably improved, and will, it is thought, be able to gradually carry out a comprehensive fire protection program there.

(9) PUBLIC EDUCATION

Carelessness, due to lack of knowledge or appreciation of fire hazards, is the cause of a large percentage of fires, and the only remedy for this is education. We put on a campaign of education each year in Fire Prevention Week.

(10) THE ASSIGNMENT SYSTEM

Under certain conditions, with fire alarms coming in from various sections of a city, the dispatching of fire companies to the locations becomes a very complicated matter, and large areas may remain without protection while companies are engaged in extinguishing fires in

ON THE JOB
This fire prevention inspector finds hazardous rubbish, including the débris from a recent fire

these or other areas. These defects are now about to be eliminated through a revision of the "running cards" and the installation of a large illuminated map at the assignment office, by which the officers in charge there can easily control the situation.

Fire Council Organized

In order to provide a means for wider knowledge of these problems and greater influence in securing accomplishment of proper solutions, the Junior Chamber of Commerce recently invited some forty other civic and trade associations into a conference, during which a full report of our activities along fire prevention lines was rendered. This meeting resulted in the formation of the San Francisco Fire Council, consisting of representatives of 35 organizations. It is thought that the Fire Council, through its wider influence, will be able to carry forward to completion the rest of the projects initiated by the Junior Chamber Committee, which of course will continue to function.

It is impossible to estimate the amount of good already accomplished by the fire prevention movement in San Francisco. The number of fires which have broken out during the last two or three years is unquestionably much lower than would have been the case if something had not been done. Fire insurance rates have been reduced. Of the fires which did not occur, or were extinguished in their incipiency, owing to the measures mentioned above, some might have resulted in serious losses of life and property.

To get back to the opening paragraph—I hope any conscientious city official who is discouraged through lack of support, will take a leaf from the notebook of Fire Chief Charles J. Brennan of San Francisco. He has hardly missed a weekly meeting of our committee and, as Chairman of our Advisory Board, has burned the midnight oil with us on numerous occasions. Consequently, we, in our small way, have assisted him in improving the efficiency of his Department and raising the standard of service to his employers—the citizens of San Francisco.

Since the recent organization of the San Francisco Fire Council, so much interest has developed on the part of its member organizations that at the time this article is written serious consideration is being given to changing the name to San Francisco Safety Council and extending its activities to include other safety matters as well as those relating to fire.

Additional Projects

A number of prospective projects for the Council to act upon are now being considered by the Board of Directors and will be thoroughly investigated by committees before submission to the Council's membership for action. These are:

1. Increase Fire Prevention Bureau from 18 to 25 men.
2. Extend the high-pressure system into certain districts not now covered.
3. Install three quick-raising modern 85-foot aerial trucks.
4. Improve safety education in schools.
5. Arrange for regular weekly newspaper and radio fire prevention publicity.
6. Install 20-inch high-pressure main on east side of Embarcadero (waterfront of San Francisco) with adequate outlet.
7. Replace worn-out fire apparatus.
8. Install automatic sprinklers on and under all piers.
9. Pass ordinance requiring automatic sprinklers in all mercantile basements.
10. Establish college of instruction for Fire Department officers.
11. Disaster plan should be worked out by city administration.
12. Fire loss data by Fire Department should be more complete.
13. Smoke extractor should be added to Department.
14. Revise and codify fire and building laws.
15. First aid instruction should be given fire and police departments, regularly.

Control of Fire by Municipal Effort

A Statement by Thomas Larke, Jr., of the Fire Principles Underlying Fire Control by Cities, Together with a List of Some of the Factors Involved

1. Prevent Fire from Starting, Where Possible

- Building Codes
- Fire Prevention Codes
- Department Inspections
- Arson Investigations
- Cooperation of Civic Organizations
- Fire Prevention Education
- Publicity
- Enforcement
- Grass-Burning Crews

2. Extinguish Fires Which Do Start While They Are Small

- Fire-Alarm System and Operation
- Running Cards
- Police and Public Cooperation
- Fire Department Drills and Training
- CO^2 and Foam Equipment
- Fire-Fighting Methods and Equipment
- Rescue Squads
- Distribution of Pumpers and Ladders
- Use of Small Lines
- Chemicals or Tank Trucks

3. Confine Fires Which Are Beyond Incipiency to Small Area

- Protection of Vertical Shafts
- Protection of Horizontal Openings
- Heavy Stream Appliances
- Water Towers
- Ladder Towers
- Smoke Extractors
- Air-Compressor Units
- Searchlight Engines
- Fire Boats
- Pipe Sizes, Gridiron, Pressure of Water System
- Hydrant Distribution
- Competency of Fire-Fighting Direction
- Ventilation Methods
- Fire Colleges for Officers of Fire Department
- Chiefs' Conferences
- Salvage Operations
- Upkeep of Equipment

4. If Fire Has Spread, Keep It from Becoming a Conflagration

- City Planning for Fire Breaks
- Protection of Roof Exposures
- Protection of Wall Openings
- Strength of Department
- Provision for Mobilization
- Use of Reserve Apparatus
- Increase of Water Flow
- Cisterns

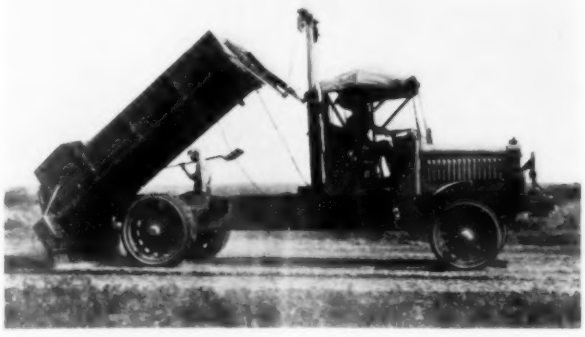
5. Prepare in Advance for a Conflagration

- Municipal Plans for Disaster Preparedness
- Calling for Outside Help
- Hose Coupling Standardization
- Use of Military
- Field Hospitals
- Emergency Housing
- Use of Explosives
- Reserve Food Supply

Surface Treatment of Low-Cost Roads with Heavier Bituminous Materials

Reported by J. T. Pauls,
Senior Highway Engineer,
U. S. Bureau of Public Roads

THE fact that the heavier bituminous materials used in surface treatment work are only slightly affected by moisture and that this treatment forms a non-porous surface mat which largely prevents the escape of air from under the surfacing and thereby tends to prevent the rise of moisture from the subgrade, is probably responsible for the good behavior of this type of treatment. The present attempt to use heavy asphaltic oils or soft asphalt cements of both the cut-back and emulsion types, is motivated by the desire to obtain not only a more stable and wear-resistant surface, but also one that will resist the action of moisture.



DETACHABLE SPREADER USED IN APPLYING COVER MATERIAL ON SURFACE TREATMENT

Surface treatments are used not only on crushed stone and crushed gravel macadam but also on old and new oil-mixed surfaces. Several types of surface treatment differing primarily only in thickness and methods of construction are used, depending largely on the surface to be treated.

"Armor Coat" Treatment Used in California

In California the so-called "armor coat" is used extensively. The old surface is first thoroughly swept and primed with ½-gallon per square yard of 50 to 60 fuel oil. Then, from ⅛- to 1/6-gallon per square yard of 95 per cent grade road oil is applied hot. This is covered with ¾- to ½-inch crushed stone or gravel at the rate of 50 to 60 pounds per square yard. It is bladed and rolled lightly. Then, about ⅜-gallon per square yard of the same grade of road oil is applied and covered with ½- to ⅛-inch crushed stone or gravel at the rate of about 20 to 30 pounds per square yard, and the surface is again rolled lightly.

On some of the older work a prime application of 60 to 70 road oil was used. This material was not entirely satisfactory, as it hardened very slowly, during which time the surface picked up greatly under traffic. A prime application is not so necessary on a well-bonded oil base or on some other types of bituminous surfacing, but should be used on an untreated macadam to tie the treatment to the base, as well as to harden and bond it. A fairly hard asphalt cement, cut back with a distillate of the kerosene type which penetrates well and is fairly quick drying, or a fluid residual from certain types of cracking plant process, should prove very satisfactory for this purpose. Light tar of 8 to 13 viscosity is being used extensively in the East but is not available in the West.

Types of Products Used for Surface Treatment

Emulsions made of heavy road oils and high-penetration asphalt cement are coming into rather extensive use on surface treatment work. This is true not only in California, but in Oregon and Washington as well.

In Oregon the practice in surface treating is to use a prime application of light oil or gas-oil tar. Otherwise the light type of surface treatment used is quite similar to the "armor coat" treatment used in California.

Multiple Lift Method Used in Oregon

Oregon has more recently been using what is termed the "multiple lift" type of surface treatment when a thickness greater than that obtained by the common treatment is desired. A thickness of 2½ inches or more can be obtained by this method. One advantage of this process is that the thickness of the surface mat can be varied to suit the traffic and base conditions on a particular project.

EQUIPMENT USED IN SOUTHERN CALIFORNIA FOR LONG-HAUL DELIVERY OF OIL

In treatment by this method the existing road surface is thoroughly swept. Then, a tack coat of about 0.15-gallon per square yard of 95 per cent road oil is applied hot. This is covered with 50 to 60 pounds per square yard of 1½- to ¾-inch crushed aggregate, which is smoothed by blading lightly, and then rolled. Following

the rolling, about 1/3-gallon per square yard of the same type oil is applied and covered with about 30 pounds per square yard of ¾- to ½-inch crushed aggregate, which is smoothed and rolled as before. Another ¼-yard application of the same oil is made and covered with about 30 pounds per square yard of ½- to ⅛-inch crushed aggregate, which is similarly smoothed and rolled.

Sometimes the final treatment of the ¼-gallon application of oil, 30 pounds of ½- to ⅛-inch crushed aggregate, and the final smoothing and rolling, are repeated to make a better-sealed surface. Greater thickness is obtained by increasing the number of lifts, that is, by doubling or trebling the initial treatment.

The cost of a 2½-inch mat constructed in this manner is rather high. This is due in some degree to the many steps involved in the construction. To obtain the same thickness of mat, a mixed-in-place method of construction is more practical and probably more economical. The heavy bituminous material, however, would have to be designed for cold application and mixing.

Use of Partial Emulsification in Oregon

Oregon has recently devised a method of partially emulsifying the hot oil for surface-treatment work, particularly for treatments using heavy oil. The plan is to combine water and an emulsifying agent, such as soap, with the hot oil at the instant it strikes the stone. This is accomplished by means of a second spray bar attached so that a spray of water is directed against the oil spray. About 10 per cent of water is required. The use of this method results, it is reported, in better covering and penetration of the aggregate.

Surface Treatment Methods in Washington

In Washington, surface treatment is used not only on the crushed gravel and stone macadam, but to a large extent on such oil-mixed surfaces as are built. The treatment is similar to the light treatments used in Oregon and California, with the exception that two successive prime applications of light oil are made. Here, as in other sections where this material has been used for priming the base, considerable peeling and raveling has occurred under traffic during the hardening of the material. This difficulty was overcome in many instances by mixing the excess primer with fine material bladed in from the shoulders. Light blading of this material over the surface of the highway has corrected many of the irregularities prior to the application of the heavier surface-treatment oil.

The riding qualities of the surface-treated roads in general compare favorably with those of the mixed-in-place types. Use of mechanical spreaders in applying the cover material, and the method of smoothing the cover with blade graders before rolling, have not only reduced the cost of construction but have greatly improved the riding qualities as well.

The Importance of Low-Cost Construction

Bituminous treatment of low-cost roads such as crushed gravel, crushed stone and soil roads are in general proving satisfactory. Limited funds with great mileages prohibit to a large extent the construction of any of the so-called permanent and more expensive types. As this condition will probably continue for many years, it is reasonable to expect that in the future these states will continue to be engaged largely in the construction and improvement of the types now being built and in the development of such other relatively low-cost types as may prove suitable.

There is no objection on the part of the western states to some increase in the cost of construction, provided such increase results in a decreased cost of maintenance. This is particularly true of those states which depend largely upon Federal Aid funds. Since the Government does not aid in maintenance, it is becoming more important, as the amount of road building increases, to keep the cost of maintenance, rather than that of construction, as low as possible. To accomplish this end, it can be expected that greater attention will be given to the use of types, methods and materials best adapted to meet given conditions.

The Distribution of Municipal Reports and Documents

IN not more than half a dozen cities in the United States is the work of distributing municipal reports and documents handled in a systematic manner. There are but few cities which possess a single agency for their distribution to libraries, institutions of learning, officials, periodicals and citizens. Each department serves as a distributing point, and there is no careful comparison of mailing lists.

Frequently a city official holding an elective or appointive office sends an annual report, elaborately bound in morocco with gilt edges and graced with his and his subordinates' portraits, to his political and personal friends and followers, who, after admiring the clearly evident greatness of their friend in office, never read even a single page in the ornate volume, and soon toss it aside. Eventually it finds its place among scrap and to the junk-heap. On the other hand, on account of the lack of discrimination in the distribution of official municipal documents, libraries, universities, civic organizations, citizens and students really interested in municipal departmental work and activity are often unable to obtain a copy of the report.

The municipal reference library should be intrusted with the work of distributing and exchanging municipal documents and be required to keep a complete list of the receivers of these reports, and adequate mailing lists. After supplying the members of the administrative and legislative branches of its own city government, the library should send such reports to the local newspapers, to special technical magazines and journals interested in them, to the officials and public libraries of other cities willing to receive such reports on an exchange basis, to universities and other institutions of learning which may desire them, and to the general public upon express request.

By placing this duty upon the municipal reference library, it is believed, not only will the use value of municipal documents be increased, but the expense annually incurred by our municipalities in the publication of them will be proportionately decreased.

—From an address by Frederick Rex, Librarian, Municipal Reference Library, Chicago, Ill., before the annual convention of the Special Libraries Association, at Cleveland, Ohio, June 12, 1931.

Recent Engineering Progress in a Modern Village

By **BRUCE D. GREENSHIELDS**
Village Engineer, Granville, Ohio

THAT it is now possible to enjoy all the physical advantages of the city and yet live in the quieter, more congenial, small town is well illustrated in Granville, a village of 1,500 inhabitants, beautifully situated among low hills in the center of Ohio. Granville is the seat of Denison University, a college with an enrollment of 900 students. It also has a fine hotel with a scenic eighteen-hole golf course.

Well-paved Streets with Long-Radius Curbs at Intersections

The town is well improved with several features of engineering interest, including wide, well-paved streets, a water-softening plant, and a sewage-disposal plant. Over four-fifths of the streets are paved with either brick or sheet asphalt. Broadway, the main thoroughfare, has a 90-foot pavement; Main Street, a 50-foot one; while the residence streets are mostly 24 feet wide.

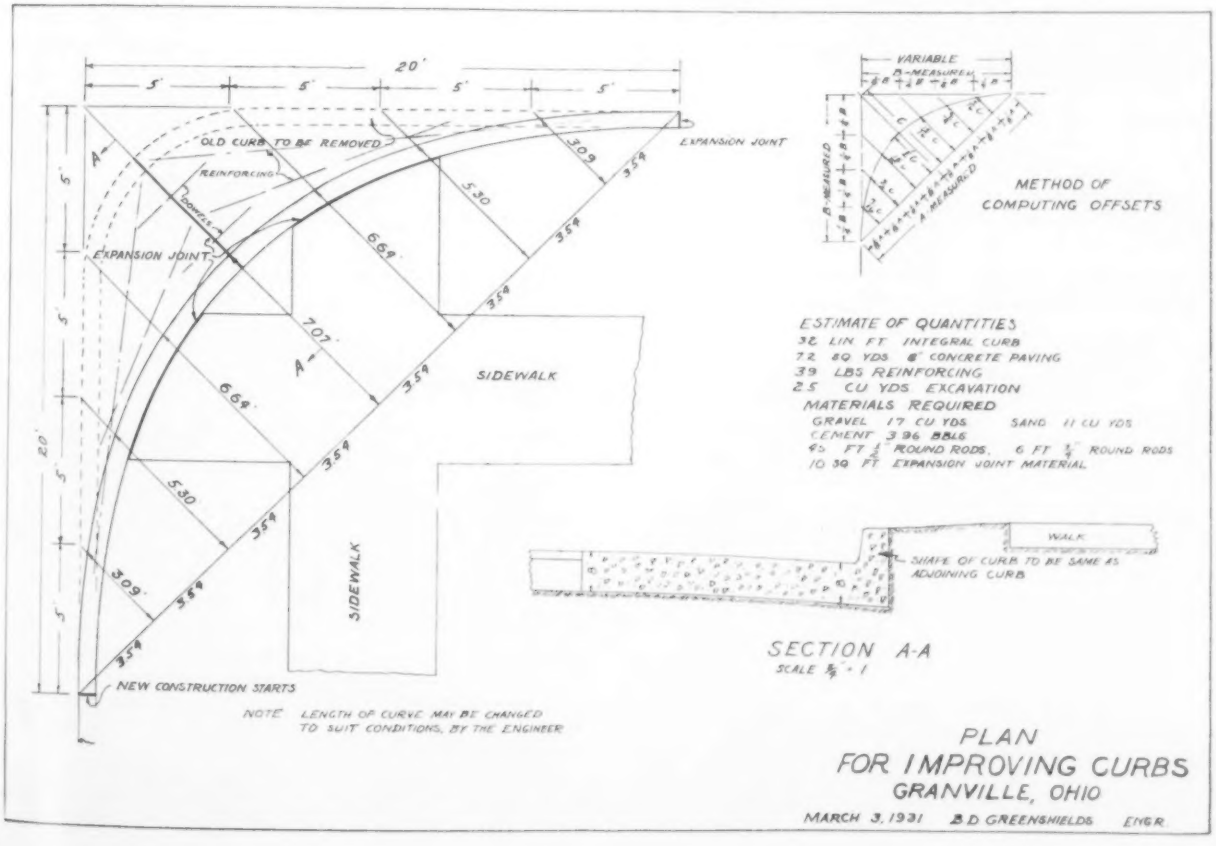
At present a contract is being let to increase the curb radius at intersections, in order to make turning easier and safer. In carrying out this improvement, it is planned to use a parabolic curve in place of a circular one. This form of curve is more attractive in appearance and more nearly approaches the path followed by a car in making a turn. The recommended cut-back will not intrude on private property or interfere with the present sidewalk arrangement. The curb radius can be increased or decreased according to the judgment of the engineer to suit special conditions. The remaining streets in town that have a gravel surface were given an asphalt carpet treatment by way of maintenance last spring. This asphalt was applied at a cost of 10½ cents per gallon.

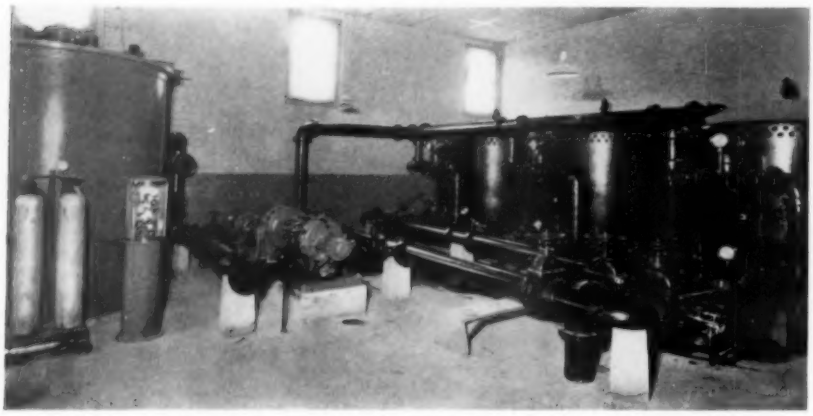
The Water-Softening and Iron-Removal Plant

A water-softening and iron-removal plant was installed in 1930 at a cost of $20,000. The source of supply consists of three wells, 175 feet in depth. The water is sumped against a head of 262 feet to a pressure standpipe located on a hill north of town. The average chemical analysis of the raw water is as follows:

Alkalinity	282 p.p.m.
Incrustants	35 "
Total iron	2½ "
Dissolved iron	.7 "

The total hardness is reduced by treatment to 95 parts per million and all the iron removed, giving a pure, palatable, sparkling clear water. The average consumption is 150,000 gallons per day, with a maximum of 250,000 gallons per day.





INTERIOR OF THE WATER WORKS AT GRANVILLE, OHIO

The main features of the plant are a settling tank of 30,000 gallons capacity; an aerator to remove the iron; three vertical pressure filters with a capacity of 100 gallons per minute each based on 2 gallons per minute per square foot of area of filtering material; a mixing chamber 7 feet, 6 inches, by 9 feet deep; a chemical solution feeder; and equipment for supplying carbon dioxide.

GENERAL VIEW OF THE GRANVILLE SEWAGE DISPOSAL PLANT

Lime and soda ash are used in treating the water, the average amount being 250 pounds of lime and 15 pounds of soda ash per day. Carbon dioxide gas is used to prevent sediment from forming in the pipes and to prevent clogging of the filters. The carbon dioxide is secured by burning about 1,000 cubic feet of natural gas per day. The gas is supplied to the gas chamber by a small compressor which is run by a ½-horsepower motor, after being cooled by passing through a bed of crushed limestone. Collins White, of Dayton, and Jennings & Lawrence Company, Columbus, were the consulting engineers for the plant, which was constructed by the F. B. Leopold Company, Inc., of Pittsburgh.

Financing

One interesting feature is the method of securing funds for the construction. When it was seen to be advisable to put in the softening plant, the water rates were raised sufficiently to secure a sinking-fund. Also, all consumers were required to have meters, which has materially reduced leakage. The water rates are now $3 per 1,000 cubic feet for consumers who use less than 50,000 cubic feet, and $2.50 per 1,000 above 50,000 cubic feet. These rates are sufficient to take care of the interest and to pay off the indebtedness in fifteen or twenty years. It was not necessary to vote bonds for the construction of the plant. Interest-bearing notes secured by the village are held by parties familiar with the situation, and it is felt that these notes will be paid off without resorting to a bond issue.

The Sewage Treatment Plant

Since 1914, Granville has had a sewage treatment plant, consisting of Imhoff tanks and trickling sand filters. The plant is becoming inadequate, and in order to secure funds for maintenance and to build up a fund for revamping the plant, a sewage ordinance bill was passed last year creating a sewer rental tax based upon the water consumption, to be paid with the water bill. This plan of basing sewage taxes upon the amount of water consumed is fairer than one based upon property values.

In order to secure public improvements, it is necessary to have town officials who not only have the community interest at heart but have the vision and the courage to withstand some criticism. Granville has always been fortunate in this respect.

The Highest Form of Police Protection

THAT the progressive adoption of mechanical devices by police departments must not in itself be accepted as guarantee of adequate protection to the public was emphasized by Bruce Smith, of the Institute of Public Administration, New York, in a Round Table address at the recent Institute of Public Affairs at the University of Virginia.

"The new means of transportation and communication," said Mr. Smith, "merely serve to facilitate quick pursuit and prompt arrest. Real protection cannot be provided without the use of a sufficient number of uniformed patrols composed of men who are carefully selected, effectively disciplined, wisely distributed, and intelligently led.

"While we have thus far failed even to attempt measurement of the deterrent and repressive influence of uniformed patrol, the preponderance of police opinion, and the results of observation, both indicate that uniformed patrols remain as the greatest deterrent to criminal acts. This respresents the highest form of protection and therefore merits that extended study which has thus far been denied to it. Various tentative experiments which have been conducted, notably in New York City, indicate that robberies, burglaries, and public disorders can be virtually eliminated through a concentration of uniformed patrols. If further studies along this line are prosecuted, and if they demonstrate that such offenses can in fact be greatly reduced, the lessons which they will hold for American police administration will be of prime significance. Such hypothesis, if established, would mean that with minor qualifications any American community could determine its own crime rate. It would mean that the community would need only to provide adequate man power, professional training for the rank and file, a rigorous disciplinary system and able direction, in order to provide that degree of protection which is enjoyed in Great Britain and in western Europe."

Tractor and Snow-Plow Performance in a New York State Town

By A. C. BERINGER

Superintendent of Highways, Ghent, N. Y.

THE town of Ghent, N. Y., has used tractor equipment since 1925 for general hauling work in connection with municipal improvement and maintenance projects. The Model 25-D Linn tractor bought in 1925 is completing its sixth year of service, and a heavier machine was added late in 1929. The town also owns a Linn-Frink Sno-Plow. The tractors are used for a variety of hauling, stump-pulling, towing, grading and snow-removal jobs, chiefly in places where steep grades, soft ground or rough roadways make it impractical to use ordinary trucks. They are kept busy on road jobs and hauling work for about 175 days of 8½ hours each year. Snow removal adds 35 days of 10 hours each, and the total is about 1,835 hours per tractor-year. The operating crews consist of one man per tractor on hauling, and two men on snow-plow operation.

The following table shows a detailed calculation of operation costs for the two tractors and the snow-plows. The depreciation and average interest charges are figured for 9,200 working hours for the tractors, which is equivalent to total useful lives of 5 years, and 5,250 working hours for the snow plow, or a total useful life of 15 years. Repair and maintenance costs are shown at the actual 5-year average rate for the older tractor, a suitable allowance being made for the newer machine. Other costs come directly from the records of the city department.

	1925 Tractor	1929 Tractor	Snow-Plow
Hourly Operating Costs:			
Depreciation	$ .688	$ .778	$ .290
Average interest @ 6%	.124	.140	.139
Straight interest on turn-in value	.016	.018	.....
Insurance	.048	.048	.....
Maintenance and repairs:			
Tractors (actually $.195 per hour for Model 25-D over 5-year period; cost on 6-28-D may be less, but allow $.250 for conservatism)	.195	.250	.....
Snow-plow—allow $50.00 per year	.....	.....	.143
*Gasoline—average 25.0 gal. per day for each at $.156 per gallon	.459	.459	.....
Oil and grease, pro-rate all uses	.061	.061	.....
Tires—$100.00 for 3 years' use	.018	.018	.....
Labor—drivers and plow man	.625	.625	.500
Totals above, per hour	$2.234	$2.397	$1.072
Tractor and plow		$3.469	

*No records were available to permit separating the gasoline or oil requirements of the new and the old machines.

On one job of excavating for a reservoir, both tractors were used, hauling loads of heavy black muck out of a shallow triangular sump partially filled with water. The total yardage removed was about 1,500, loose measure, the haul being 300 to 400 feet one way. The whole job required 29 working hours, or about 3.4 days of 8.5 hours each. The cost was $1.07 per ton-mile for the 1925 tractor, and $0.86 for the 1929 tractor, the difference of $0.21 a ton-mile representing a cost reduction of 19.6 per cent in favor of the newer and more powerful tractor, which moved about one-third more material.

On another job hauling field stone over generally soft ground with grades up to 10 per cent against the loads, the tractor cost per net ton-mile was $0.83. The new tractor handled this job alone, carrying 6.1 ton-loads of field stone over a haul of 2,640 feet one way. Haulage was limited to 8 strips daily because of hand loading.

Both tractors were used on a road-grading job hauling loads of loose gravel over soft ground and up grades of 15 to 30 per cent. One-way trips were from ¾ to 1 1/3 miles in length. The net costs per ton-mile were $0.33 for the older tractor and $0.19 for the newer machine, the cost advantage of the latter in this case being about 42.5 per cent.

A truck with dual pneumatic tires in the rear was also in use on this job. On a timed run over a distance of 2.6 miles, the truck made the round trip in exactly 27 minutes with a 3½-yard load, loose measure. The new tractor made the same run in 30.7 minutes with a 6-yard load. The truck worked hard in first speed on all grades above 5 per cent, whereas the tractor took grades up to 30 per cent in third. The tractor had a further advantage in being able to turn around easily at both ends of the run, whereas the truck was obliged to run several hundred feet farther on each end to avoid getting off into soft ground.

Snow Removal

During the winter of 1929-30, snow plowing, which was formerly handled by the 1925 tractor equipped with a plow, was done by the new tractor equipped with a Linn-Frink plow. The new plow clears a wider roadway and pushes more easily than the old one. A swath up to 22 feet wide can be cut through 6- to 8-foot drifts at a speed of 3 to 4 miles per hour and a cost of approximately $0.93 per mile. For snow one foot in depth, the speed is approximately 7½ miles per hour at $0.46 per mile; for 2- to 3-foot snow, 6 miles per hour at $0.58; and 4- to 5-foot snow, 4 miles per hour at $0.87.

Either of the tractors can pull a single 10-foot grader with little effort and could handle two or more at the same time, if convenient. Speed on such work is limited to 4 miles per hour, because the grader tends to skip if pulled faster. Tractor costs for such work, based on hour rates of $2.234 and $2.397 for the old and new tractors, respectively, are $0.56 and $0.60 per mile.

ACKNOWLEDGMENT.—From a Nielsen Survey.

EDUCATIONAL FORESTRY

NATURE'S laboratories are being used in 150 communities in the state of Georgia for the teaching of practical forestry to high-school students. The plan, looking to the future conservation of scenically and commercially valuable timberland, has been developed by the State Board of Vocational Education in cooperation with the Georgia Forestry Service. Under it, each of the 150 communities has a "school forest," turned over to the trustees by the owners for study and care for a ten-year period.

In outlining the program, Paul W. Chapman, State Director of Vocational Education, expressed the belief that it is the most unusual and practical method of teaching forestry yet to be adopted in the United States.

Why Not a Park and Bird Sanctuary for Your Community?

The Matawan, N. J., Experience Points the Way

By **CARL F. PILAT**
Fellow, American Society of Landscape Architects

IN towns and cities throughout the country there are both need and opportunity to create places for the conservation of the wild birds, native trees and shrubs and wild flowers. Terhune Park and Bird Sanctuary, now in process of development at Matawan, N. J., is such a spot.

The need arises from the rapid encroachment of urban and suburban life upon the countryside. If protective steps are not taken, our communities will soon be lacking in an element that is of incalculable value to the people—contact with nature.

The opportunity lies in the prevalence of natural park sites and in the willingness of public-spirited citizens to cooperate in turning them into pleasant parks. It is safe to say that there are few communities that have not within their boundaries a tract of land that can be acquired and made into a naturalistic park and bird sanctuary at comparatively little cost to the public. Frequently, the owner of such a property will present it to the community for this purpose.

That is what happened at Matawan. Acting upon the writer's opinion, given after a careful examination of the property, that land at the southwest corner of South and Main Streets, Matawan, could be made into an attractive park and bird sanctuary, the Hon. Henry S. Terhune deeded the property to the borough. Judge Terhune recognized the fact that some expense would be incurred in shaping-up the tract, and wished to relieve the taxpayers of a least a part of such expenses. He therefore presented the Board of Councilmen with a sum of money to be used in development work. Then Councilman George S. Barrett, finding that a strip of land owned by him was needed to bring the park out to Broad Street, deeded it to the borough. The Park Committee and the citizens in general have shown a lively interest in the project, which has attracted wide attention.

Method of Treatment

A naturalistic method of treatment has been adopted, with just enough formality to provide the needed accent. This makes for economy not only in the development of the park, but in its maintenance, and for the highest degree of suitability and charm. Throughout the study of the problem and the making of the plans, the aim was to utilize to the fullest extent the natural advantages of the property in creating, without unnecessary expenditure, a park of the greatest possible interest, beauty and public usefulness. The contour of the terrain and the existing trees have been made the basis of the plan, a method of procedure that is at once economical and effective. The result is a landscape treatment free from forced effects, characteristic, and individual.

Views and Vistas

The plan shows how beautiful views and vistas in all directions have been created by the arrangement of foliage masses and planting in relation to the contour of the ground. Several views of especial charm are indicated by arrows on the plan. One of these views will be from the east entrance, at the corner of South Street and Broad Street, between masses of foliage, towards a group of three fine trees. From the same point of view, the flower garden will be seen at the end of a vista, down the length of the lawn. Through a gap in the planting in the center of the South Street boundary, there will be a delightful view across the lawn and meadow to the woodland. From the flower garden, there will be especially fine views looking towards the east entrance and up across the meadow.

A Focal Point

A sunken flower garden has been planned for the natural depression near the corner of Main Street and South Street, which affords an ideal location for it. A circular arrangement of flower borders is planned for perennials and some annuals. In the center is a place for some such feature as a sun dial or a bird bath. Surrounding and partly enclosing the garden will be an informal grouping of flowering shrubs, effecting an agreeable transition between the formality of the flower garden and the naturalistic treatment of the park in general. Lying gem-like beyond the lawn area, with fine trees for a background, this garden with its bright flowers will be seen from the sloping lawn and from the walks that wind through the park, also from the sidewalk of Main Street.

The Wild Garden

The natural characteristics of the valley along the southwesterly boundary suggested the trail which will wind between a strip of woodland and a wild garden with native shrubs, ferns and flowering plants that naturally grow in such a valley and love the shade. Here berry-bearing trees and shrubs will provide food for birds. The location is protected from the wind by the slopes at either side, and the native trees of suitable character will provide them with shelter. In winter, additional shelter, together with feed boxes, will be provided. Near the end of the wild garden, in the southwesterly corner of the park, nestled in a bower of hemlock and laurel, and surrounded by Alpine plants, ferns and native shrubs, will be a rustic pool with a small stream of water, like a natural spring, falling into it from rockwork of boulders. Here the birds may drink and bathe. Altogether, this will make an ideal bird sanctuary.

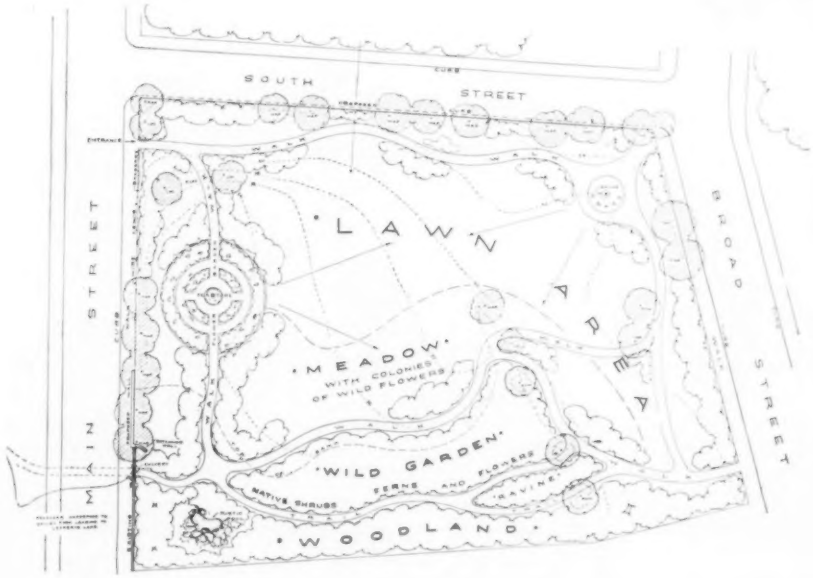
The walk following the top of the bank above the wild garden will command a view of this garden on the one hand, and of the meadow and lawn sloping away, on the other hand, to the flower garden. The meadow, spreading over the sloping ground, with its wild flowers that love

the sunshine, will not only lend beauty to the park, but will soften the outline of the lawn pleasantly and will unite the wild garden with the flower garden.

Other Features

A large part of the park will be in grass, providing the open area needed to give a sense of space. It will supply the simple middle distance in the innumerable charming landscape pictures formed by views of the various features of the park, and it will be made interesting by the shadows cast upon it by trees and by passing clouds.

The entrance at the corner of Broad Street and South Street, which is nearest to the High School, will be emphasized by a circular area of grass in the center of which may be placed some such feature as a drinking fountain. Here the walks branch to right and left, and this forms a



vantage point from which to enjoy the park's beauty.

Though the treatment is naturalistic, care has been taken to provide walks that afford a direct means of passing through from street to street, winding only slightly, and connecting walks so arranged that access will be easy to all features and that a succession of beautiful views will be unfolded. At a point where there is now a culvert, near the westerly corner of the property, an underpass can be constructed to connect this park with Valley Park, through which that beautiful sheet of water, Lefferts Lake, can be reached.

When, as in this case, the property is well provided with desirable shade trees, they may be made to work in to great advantage in naturalistic treatment, though more or less supplementary planting of trees is usually necessary. Here, such planting is needed, as indicated on the plan, along the Broad Street boundary and between the trail and the boundary nearest to it, to provide a background and to secure the degree of seclusion that makes a park restful.

Value of a Comprehensive Plan

Though it is not always practicable to carry out the improvement of a park such as this in one operation, it is highly important that the improvement be planned in its entirety at the outset. Then the work may be carried forward a part at a time, thus spreading the cost of the improvement over a long period, to make it easy to meet. When everything that is done is a part of a consistent and well-studied plan, there need be no waste through changes; every step may be made to count towards the final development of the park as a complete and harmonious whole, at the lowest consistent cost.

Usually it is possible to develop a portion of the property in such a way that it can be made available for use as a park promptly and at no great cost. Often a moderate amount of grading, the construction of some of the walks and the preparation and seeding of a portion of the ground, will quickly put the park site into condition to be used by the public.

The first thing of importance is for some one in the community to realize the need and the opportunity and to make known to others the comparative ease with which a park of this kind can often be secured. Some one is likely to come forward and open the way. It is surprising how rapidly such a movement can gain headway when it is once started.

Accountants Co-operate in Drafting City Charter for San Francisco

THE city of San Francisco had the cooperation of a committee of public accountants in the drafting of its charter as recently approved by the Legislature and adopted by the people. The committee consisted of William Dolge, Chairman, Fred Bullock and John F. Forbes.

Sections to which the accountants devoted particular attention are those relating to the handling of the city's finances, and including:

Appointment of a controller and his powers, duties, reports and audits.

Preparation of budget estimates.

Creation of the office of chief administrative officer at a salary of $12,000 a year, to be appointed by the mayor and to act as supervisor of the administrative departments, as a kind of executive assistant to the mayor.

A provision that taxpayers winning suits against civic officers, boards or commissions be allowed costs and reasonable compensation for attorney's fees, to be fixed by the court.

The accountants also helped on sections relating to depreciation of municipal utilities, purchasing, city contracts, bond issues, civil service, pension and retirement funds and compensation insurance.

Laying a Cold-Mix Asphalt Top in Georgia

By **B. P. McWHORTER**
State Highway Engineer of Georgia

SPREADING AND RAKING THE MACASPHALT SURFACING
Note the lines left by the steel T-bar used to secure a uniform spread

DURING the years 1929 and 1930 the State Highway Department graded a road through the mountainous section of north Georgia, opening up a prosperous farming and orchard section heretofore inaccessible except during periods of dry weather. Even with most favorable weather conditions, one could travel only with great difficulty. This connection forms a cross state trunk line highway destined to become one of the heaviest traveled roads in this portion of the state. It creates a direct connection between the manufacturing and industrial centers in northeast Georgia and the northwest portion of the state, where are to be found numerous mining deposits, manufacturing enterprises and other industrial activities. This route also passes through one of the largest marble deposits in the world, this being in Pickens County.

The project highway is entirely in Pickens County and is a section twelve miles in length, running west from Jasper, the county-seat, toward Fairmount.

Grading

The grading of this section was very heavy, necessitating extremely large cuts and fills. Owing to the very poor character of the soil, difficult subgrade conditions developed. Because of this and the great danger of settlement on the heavy fills, a flexible type of pavement was selected. The first type of base chosen was a clay-bound macadam, but because of the inferior quality of clay available for use as the binder, this type was abandoned. Careful examination disclosed the fact that a large number of the cuts contained a certain percentage of alum, which during the process of excavation was distributed over the entire subgrade. Throughout the project, where the subgrade drainage was found to be poor, French drains were constructed at sufficient intervals to reduce the condition to a minimum.

Base Aggregate

The type of base finally selected had never been introduced in Georgia, and the method of construction was different from any heretofore attempted in the state. We desired a type that would be flexible and at the same time serve as a French drain at the bottom, should water seep through the subgrade into the base. For this reason we selected what is termed as a bituminous-bound stone macadam base.

The nearest quarry to this project was seven miles away and was inaccessible to trucks, as it was situated in a very mountainous section. It was therefore necessary to ship the stone to a point at the eastern terminus of the project. The quality of this stone was very good, showing a French coefficient of twelve, and was identified locally as Whitestone. This material was mined from the interior of a mountain primarily for the purpose of manufacture into terrazzo stone. The portion that failed to measure up to the desired color was stock piled along the railroad, and that selected for our purpose was screened into a size ranging from 3 inches down to ½-inch. This gradation was believed most desirable for a base of this type. The thickness of the base was 4½ inches compacted, obtained by placing material 5½ inches loose, which proved to be the maximum amount that could be rolled under 10-ton pressure without unnecessary shoving of aggregate.

Methods of Base Construction

The initial step taken in placing the base was to fine grade the subgrade and set 2 x 6-inch form boards, which were left for permanent use in order to hold the base in its true cross-section. The base was constructed 19 feet in width, with a 2-inch crown. A scratch template was run along the form boards, and the subgrade was brought to the true cross-section before the aggregate was dumped on the road. The material was then dumped, spread, raked, rolled and straightedged. After this operation the bituminous material was applied by a pressure distributor.

The asphalt used was a 60-80 penetration meeting state highway specifications. The bituminous material was applied at a rate of 1½ gallons per square yard measured at 77° F. Immediately following this application, 35 to 40 pounds of ¾ to ¼-inch choker stone per square yard was spread over the surface and rolled with a 10-ton roller until the choker stone became thoroughly seated. The surface was again checked by a straightedge, and any depressions greater than ¼-inch in 10 feet were taken out by

THE FINISHED ROADWAY AFTER FINAL ROLLING

re-rolling. The asphalt penetrated the base stone to a depth of 3½ to 4 inches, leaving sufficient voids at the bottom of the base, which served as a French drain and kept the subgrade free from moisture and also kept it stable.

The base was constructed throughout the entire project before any of the seal was placed. During the period the base stone remained open, numerous rains fell and water leaked through the base in several places, causing settling on the subgrade. As previously outlined, French drains were constructed at proper intervals and carried as far as the limits of the shoulders. These drains were so constructed that the top of the drains came in contact with the bottom of the base stone, thereby draining out any water collected and preventing failures. Inasmuch as heavily loaded 5-ton trucks were operated regularly over sections of the base and no failures of any description developed, it was proved clearly that the theory of this type of construction was sound.

The Cold-Mix Asphalt Seal

The type of seal selected was a cold-mix asphalt, and in order to form a watertight seal a sheet type mixture was advisable. Macasphalt was accepted for this surfacing, and it was decided to place the seal to a depth of 1½ inches, which would yield approximately 13 square yards per ton. Funds were somewhat limited at that time, and in order to be able to eliminate all inequalities in the base, the Macasphalt was placed to yield approximately 15 square yards per ton, thereby reducing the thickness to an average of approximately 1¼ inches.

Method of Laying Seal

The material was unloaded from cars and hauled in 3-ton trucks to the farther end of the project where the operation began. Depth-gage strips for regulating the thickness of materials were made of steel ¼ x 2 inches x 10 feet. These were laid on the base and the Macasphalt was shoveled in and raked to a uniform depth. The gage strips were then pulled forward and the surface was rolled with a 10-ton tandem roller until thoroughly compacted. The surface was then straightedged and any depressions appearing more than ¼-inch in 10 feet were rectified by adding extra materials or by raking off the high spots.

Results

The results so far have been entirely satisfactory, this section of road having passed through the winter without a failure. The seal appears to be in perfect condition, notwithstanding the fact that it has stood the ravages of unusually hard weather during the five winter months.

It is believed that there is a good future for sheet types of certain of the cold-mix asphalts, both on construction and maintenance; they can be readily obtained at a nominal cost, they give a granular non-skid surface, remain flexible and can be applied cold, which in itself is a distinct advantage in road construction and maintenance. Ordinary common labor can efficiently lay the material and get a good road, as has been proved in this case.

It is our opinion that the natural bitumen contained in these mixes gives the materials flexibility and long life, and with a proper gradation of the aggregates in the mix, the stability can be controlled satisfactorily.

A SECTION OF THE FINISHED HIGHWAY BETWEEN JASPER AND FAIRMONT AFTER TWO MONTHS OF TRAFFIC

AN ELEVATOR SAFETY CODE

A NEW national safety code for elevators, dumbwaiters, and escalators, developed under technical direction of the American Society of Mechanical Engineers, the American Institute of Architects, and the United States Bureau of Standards, has just been approved by the American Standards Association. Approval of the revised code by the Association followed nearly four years of research on elevator safety devices at the United States Bureau of Standards, and extensive investigation by a technical committee composed of 38 representatives of architectural, engineering, governmental, and other organizations.

In the tests conducted during the research work, the cables of the suspended elevators were severed, allowing them to plunge downward in their shafts. Motion-picture apparatus fixed under the cars recorded pictures at the rate of 3,600 per minute, revealing the precise operation of the safety devices.

"Cost-Value" Contracts Save Money for London County Council

The Lower the Cost to the County, the Greater the Fee to the Contractor

By **T. PEIRSON FRANK, M. Inst. C.E., F.S.I.**
Chief Engineer to the London County Council

IN view of the character and magnitude of the housing schemes undertaken by the London County Council after the war, it was evident that the contractors to be entrusted with carrying them out must be such as had had experience of large public works, of both an engineering and a building character, and must also be in command of such an organization as would leave no doubt of their ability to carry out the undertakings. The size of the contracts involved, the constantly fluctuating prices of labor and materials, and the unsettled conditions prevailing in British industry generally in the immediate post-war period, rendered it impossible to obtain acceptable firm-price tenders on a competitive basis in the manner customary before the war.

General Provisions of the Contract

The line of action followed by the Council in the large housing contracts has been that of financing the undertaking and bearing the actual cost of the work, the contractor being remunerated by a fee for his services, and, as a general practice, one master contractor only being engaged for each estate. The contracts, which may for convenience be termed "cost-value" contracts, provide that the contractor's fee shall be a percentage of the measured value of the work and shall be increased or decreased on a definite scale, according as the actual cost is less or greater than the measured value.

This form of contract is particularly advantageous when circumstances arise which make it necessary to effect changes in the layout while the work is actually in progress. Under a contract at fixed prices, a contractor might be justified in claiming considerable amounts for the loss of his profits due to the disturbance of his program of operations. Under the "cost-value" contract, as the Council is bearing the actual cost of the work, the expense of such changes is not more than what they actually cost, the contractor's claims, if any, being limited to the "value" account.

The Contractor's Obligations

The work of developing a housing estate is described in the contract under the following heads:

a. The construction, provision and maintenance of adequate means of transport, and their operation.

b. The exploration of the estate and the winning, conversion and rendering available for use (if found) of any suitable materials (gravel, sand, etc.).

c. The provision of office accommodation and mess-rooms, with fittings.

d. The carrying-out of certain tests of materials and workmanship.

e. The arrangement of the recruitment, distribution and supervision of labor.

f. The making of bulk purchases of materials, etc.

g. The keeping of cost and other financial accounts.

h. The construction of such roads, sewers, houses and ancillary works as may be ordered.

i. The maintenance of the work for the periods specified.

j. The scavenging and cleaning of roads, pending their being taken over by the local authority.

k. The performance of any other necessary services.

The part of the "cost-value" contract relating to specifications, drawings, etc., is practically the same as that to be found in an ordinary firm-price contract, and as the employer is bearing the cost of the undertaking and must therefore have full control over expenditure, purchases, accounts, etc., regulations as to accountancy, etc., are included similar to those found in the "cost plus profit" contract under which large works had to be carried out during the war. Purchases, subcontracts, etc., may not be arranged, nor, in fact, any expenditure over a certain amount incurred without the approval of the employer, that is, the engineer or architect. The difference between the "cost-value" and the "cost plus profit" contracts is that while under the latter the profit is a direct proportion of the expenditure, and there exists, therefore, a definite incentive for the contractor to spend as much as he can induce the employer to pay, under the former the reverse is actually the case.

The Contractor's Fee Increases as Cost Decreases

The "measured value" of the work is obtained by measuring the work and pricing it at rates and prices previously agreed upon in exactly the same manner as is done for a firm-price contract. The contractor's profit in the first instance is a percentage of "measured value." This constitutes his "basic" fee or commission. The "measured value" is then compared with the actual cost of the work, and the basic fee or commission varied accordingly. The lower the cost as compared with the measured value, the more is the fee increased, and a large saving yields a greater proportionate increase of profit than would a smaller.

The contractor is thus furnished with a strong inducement to save the employer's money, and this inducement is reinforced by a converse provision that, should the cost exceed the measured value, the profit will be reduced, a greater proportionate reduction or penalty being inflicted for a larger excess of cost, than would fall to be deducted for a smaller excess. The contractor is, however, guaranteed a minimum profit. In no circumstances could he be in the position of having to work at a loss.

The following extract from a current contract will show how this arrangement is worked out in practice:

The amount of the fee payable to the contractor for his services under this contract shall be dependent upon the result of a comparison which shall be made of the actual cost

of the work with the revised total value (or measured value) of the work, as follows:

(a) If the actual cost of the work shall be equal to the revised total value of the work, then the percentage applicable shall be x.....* percentage of the revised total value of the work.

(b) If the actual cost of the work shall be *less than* the revised total value of the work, then the percentage applicable shall be the normal percentage *increased* by such percentage thereof as is indicated in the following scale.

Column 1 — Percentage of the revised total value of the work by which the actual cost of the work is *less than* the revised total value of the work:	*Column 2* — Normal percentage to be *increased* by the following percentage thereof:
Per Centum	Per Centum
1	2½
2	5½
3	9
4	12½
5	16 2/3
6	21½
7	27
8	33 1/3
9	40
10	50

Provided that in no case shall the normal percentage be increased by more than 50 per centum thereof.

(c) If the actual cost of the work shall be *greater than* the revised total cost of the work, then the percentage applicable shall be the normal percentage *decreased* by such percentage thereof as is indicated in the following scale:

Column 1 — Percentage of the revised total value of the work by which the actual cost of the work is *greater than* the revised total value of the work:	*Column 2* — Normal percentage to be *decreased* by the following percentage thereof:
Per Centum	Per Centum
1	2½
2	5½
3	8½
4	11½
5	15
6	19
7	23
8	27
9	32
10	38
11	44
12	50
13	57½
14	66
15	75

Provided that in no case shall the normal percentage be decreased by more than 75 per centum thereof.

* This quantity depends upon local and general conditions in the industry, the extent of the contract, and the competition for it.

If the result for column 1 contains a fraction, a proportionate fraction is calculated from the two opposite and adjacent figures in column 2.

This illustrates how the contractor's remuneration is dependent on the "revised total value" or "measured value" of the work varied by a comparison of this with the actual cost of the work.

The "actual cost" is a question of fact and need not be discussed. It is the whole cost of the undertaking as reported by the employer's accountant or auditor, and certified as properly incurred by the engineer or architect on the completion of the work.

Determining the Rates and Prices

The basic rate of fee—that mentioned in paragraph (a) above—and the rates and prices on which the revised total value or measured value of the work is to be calculated are matters for the agreement with the contractor. Either or both may be used as a basis on which to seek tenders. For example, a percentage of, say, 1 to 3½, according to the extent of the work, might be fixed by the employer as a basic rate of remuneration and tenderers asked to state the rates and prices for the purpose of calculating the value for which they would be prepared to do the work.

In this connection it has been found convenient to have the original schedule of prices prepared by quantity surveyors. The actual schedule included in the contract is either these as they stand or other prices so much up or down on them as may result from tenders received or other negotiations with the contractor.

Variations in Costs and Other Details

If the contract is a large one and likely to extend over some years, alterations in the designs and specifications are certain to creep in, and, in addition, there is the probability of considerable variation taking place in the cost of labor and materials. Provision is therefore made in the contracts for the basis on which rates and prices for classes of work not included in the original schedule are to be agreed, and, in addition, provision that the measured value shall be adjusted to reflect any rise or fall in the cost of labor and materials that might take place after the date on which the contract is signed. This latter would probably be unnecessary during periods of stable prices, but has been considered both equitable and necessary during the years following the war, when costs were extremely variable, in order on the one hand to protect the contractor from suffering penalty owing to a rise in costs over which he has no control, and, on the other hand, to prevent him from having to be paid bonuses which he has done nothing to earn.

To meet the possibility of the contractor's proving incompetent or only capable of smaller-scale operations than those undertaken, the contract provides that the work can be limited as desired, and, further, that separate contracts can be entered into by the employer. In this latter event, the contractor would receive a nominal commission. The contract can also be terminated at any time by giving seven days' notice.

Under the contract the contractor is held responsible for the proper and efficient conduct of the work and the economical and proper use of materials, etc., and any useless expenditure incurred by him is not admitted as part of the actual cost, but has to be met out of his own pocket.

It may appear that the percentages for the basic fee mentioned above, viz., 1—3½, are small, but in this connection it must be remembered that the contractor is saved the expense and spared the risk of financing the works with his own money and that the risks of loss inherent in fixed-price contracts are entirely absent.

As an illustration of the extent of work that can be successfully dealt with under a "cost-value" contract, it may be added that operations under one such contract have been in progress for the last eleven years, and will doubtless continue for about another two years, when some 25,000 houses, housing a population of over 100,000 persons, will have been erected, at a total cost of some 11 millions of money (more than $50,000,000), probably the largest building undertaking of its kind in the world.

This was the first of several post-war housing schemes undertaken by the Council by the "cost-value" type of contract, the form of contract adopted having been drawn up by Sir George W. Humphreys, K. B. E., M. Inst. C. E., the late Chief Engineer of the Council.

THIS GARAGE BUILDING HOUSES FIFTEEN TRUCKS BELONGING TO THE REFUSE COLLECTION DEPARTMENT

Threatened Strike Creates Municipal Utility in Tacoma

By **H. C. McGARICK**
Superintendent,
Refuse Collection Division,
Department of Public Welfare.
Tacoma, Wash.

FOR many years prior to the inauguration of its own garbage collection service, the city of Tacoma, Wash., had private company service, which was restricted to the voluntary subscriptions of its customers, who numbered approximately 6,000. During this period residents without regular service, totaling about 18,000 households, disposed of accumulated garbage and refuse at their own convenience. In many cases this was done in a satisfactory and safe manner, but in a great many other cases, from the standpoint of city cleanliness, this privilege of personal disposal was grossly abused. Through the outlying sections of the city the large piles of cans, refuse and débris accumulated, and garbage and refuse were found dumped in alleys, on highways outside the city limits, and in and beside the city streets.

Taking cognizance of this condition and for the purpose of placing the city of Tacoma on a parity with most other cities of like population in the United States in the matter of refuse collection, the City Council was empowered by a provision in the city charter to inaugurate a universal city-wide collection service. A careful study of ways and means and an investigation of operation by a private contract under municipal supervision, as well as of the possibility of the city's operating the collection and disposal service as a public utility, were made. During the time required for the investigation, the private company then operating continued to serve its customers as before. This company requested an unlimited franchise for the collection of refuse in the city and, in an endeavor to force the Council to accede to its proposition, served an ultimatum on the city on the afternoon of January 3, 1929, that it would discontinue operation at midnight. In this manner a real emergency was created, but Mayor Tennent, in his capacity of Commissioner of Public Welfare, instituted a collection and disposal service by hiring equipment and men and was able to furnish adequate service, beginning at 5 A.M. January 4, 1929.

Difficulties Encountered

Some of the difficulties of this period of operation can be realized when it is considered that the city possessed no books and no list of customers and was forced to rely upon requests by persons in need of service. It had no office force, except a few employees of other city departments who could be drafted for the emergency period. Trucks were hired and the crews of the old company were given immediate employment with instructions to cover their old routes as heretofore. There were serious legal and financial angles which were carefully studied and on January 10, 1929, an ordinance was passed creating a Garbage and Refuse Department, operated as a public utility by the city of Tacoma. This further created an organization and a fund for the operation of the Department. It was found

immediately that the truck crews which had been employed by the old company and were then working for the city were mostly foreigners, and, not being naturalized, they could not hold city positions. This difficulty was overcome by letting a contract for the collection and disposal of the garbage, which took the men out of the employment of the city.

The city dump was found to be in a very bad condition and had to be improved at rather heavy cost. An office force was employed, ten trucks were ordered and land was purchased for the construction of a garage building for housing the trucks. Up to June 1, 1929, no financial statement of the operation of the Department had been made, so the City Comptroller placed his representative in charge of accounting as provided under the city charter, and on July 15, 1929, general ledgers were opened. From July 1 until March, 1930, from 50 to 200 services were added each day, necessitating a constant enlarging and readjusting of routes and additions of new equipment.

Early in 1929, the Department began to stock and sell garbage cans of the approved type and size specified in the ordinance creating the Department. This was done to render another service for the convenience of the customers. The Department has always maintained standard prices on the line of can it carries and has at no time entered into a program of competitive merchandising. As the original demand for cans was met, sales of this commodity have gradually fallen off, until at present, from a merchandising standpoint, the sales are negligible.

Present Collection Service

The Department is now serving 22,917 customers per month and has made an average of 25,157 pick-ups weekly, exclusive of special services. By special services is meant all extra service pick-ups made in addition to regular services rendered. There are twelve trucks in service on regular routes, covering the entire city weekly, and one lighter truck for extra and emergency service and two large trucks in reserve.

During 1930, a total of 1,308,180 pick-ups were made by the Department on regular calls. This averages better than 50 pick-ups per hour per truck. In making this record only 198 cans were missed or overlooked.

Daily collections are made on commercial service, which creates larger amounts of refuse. In outlying districts collections are made two or three times a week. This accounts for the apparent discrepancy between the number of customers served and the number of pick-ups weekly.

The personnel of the collection service consists of a plant foreman, a junior clerk in the garage office, 12 truck drivers and 23 garbage collectors. At the garbage building for housing the trucks, two servicemen are employed on each shift. These men keep a close check on the trucks, keeping them well greased and oiled, check up on all loose bolts, nuts, etc., send trucks to the city plant and shop for mechanical repair, and have the trucks in good condition to start each day at 5:30 A.M. Locker space with shower baths and a drying room for work clothes are provided at the garage for the men engaged in the collection of garbage. A wash rack has been built for the trucks themselves, and each truck is thoroughly washed each day by high-pressure hose before being housed in the garage. The driver of each truck is responsible to the foreman of his unit, who is in turn responsible to the superintendent.

There are about 25,000 to 26,000 possible services in the city, with about 3,000 of these not yet receiving service.

Disposal by Sanitary Fill

The old city dump was abandoned in July, 1930, and a plan of using refuse and garbage for making sanitary fill of city streets was inaugurated. Garbage previously hauled to the old city dump is now being used to fill a roadway across the tide flats, and in the course of time, according to the accumulation of refuse, a full-width roadbed will have been constructed with no additional cost to the taxpayers or property owners.

The Department is using the south end of the South Tacoma swamps as a dump, making a sanitary fill that will in time be available for a number of uses, such as a park or a play field.

The method of the disposal of the garbage and refuse

A PORTION OF THE SANITARY FILL OVER SWAMP LAND WHICH IS BEING RECLAIMED IN THE SOUTHERN PART OF TACOMA

at the dump is by filling and burning. Green or fresh garbage burns readily and leaves a solid ash formation. Filling material such as old brick, dirt from excavations, and bank run gravel are used in covering. One or two men are used on each of the dumps. These men direct the fill, see that the garbage is dumped and spread, properly covered with earth, and properly burned. They handle all the garbage dumped daily and all dirt that is hauled for covering, and keep the roadways in shape for the trucks working over the dump.

In order that the ever-present scourge of rats around garbage dumps may be held to a minimum, the Department purchases large quantities of rat poison, which is placed in bait on the dumps by a representative of the U.S. Department of Agriculture. At the time the old dump was abandoned, it was given a thorough treatment, which, according to the Department of Agriculture representative, was completely effective in exterminating all rodents nesting on the dump at that time. In this manner any migration of rodents from the dump to other parts of the city was effectively checked. The new fills are being kept free from rats by the same thorough treatment, and to date no rodents have been discovered.

Administration

The commercial office serves as the direct contact between the Department and its customers. All bills are prepared and mailed from the office. The individual customer accounts are kept up to date, with a record of the kind and class of service rendered each individual customer, and all charges and payments are posted daily to the individual accounts. All orders for new services, changes of services, new addresses, all sales of cans, adjustment of accounts, complaints and general information regarding services are handled in the commercial office, where the most up-to-date labor-saving and efficient modern office methods and systems are used.

A complete Addressograph installation was made at considerable cost, which has practically paid for itself in time saved since its installation. A stenographer can in 8 hours type addresses on about 600 bills. The same work is done on the Addressograph in about 30 minutes. Modern bookkeeping equipment for billing has been installed, and with one bookkeeper full time, with help for a small time weekly, all ledger postings for over 22,000 customers are kept up daily and billed regularly. The Department will be able to handle the normal service increase for some time without increasing costs.

The actual amount of office work required for satisfactory operation is perhaps large when a comparison is made with the gross revenues of the Department, but a proper comparison can be made only when the number of customers' accounts kept by the Department is considered. The heaviest costs in connection with office administration are chargeable to mailing, which includes bills, stamps, envelopes, etc. There is no chance of reducing this cost under the present set-up, but, on the other hand, it will increase with the normal growth of the Department. The total cost per customer is low, amounting to less than 6 cents per month, including all mailing cost, as well as salaries, telephones, materials, supplies and maintenance of equipment.

The office personnel consists of one chief clerk in charge of the office, the bookkeeper of commercial accounts, a clerk-stenographer for general office work on the information desk, a clerk-stenographer in charge of the addressing equipment, and a stenographer for general office work.

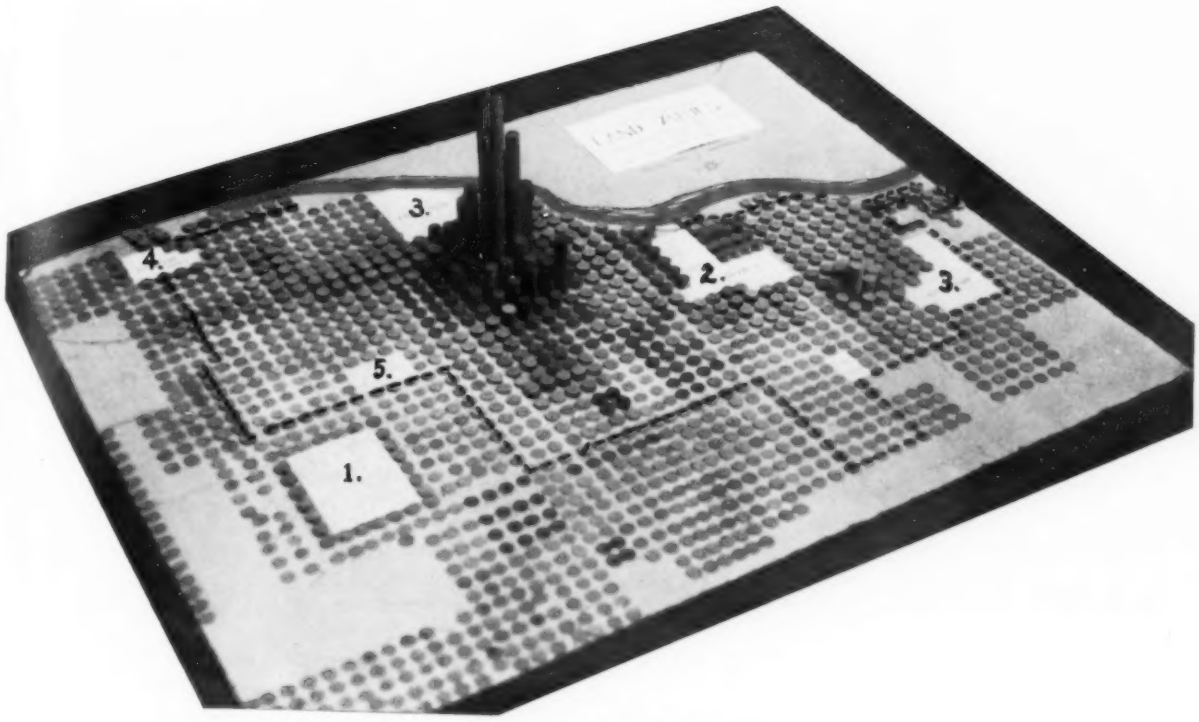
STATISTICS OF OPERATION FOR 1930

Average number of customers served per month	22,771
Average number of pick-ups per month	109,016
Average miles traveled per month per truck	518
Average monthly gasoline consumption per truck, gallons	171
Actual number of cans collected on regular service	1,308,180
Average number of cans collected per hour by truck	53⅛
Average cost of operating commercial offices per customer per month	$0.05496
Average cost of collection per customer per month	0.30473
Average cost of disposal per customer per month	0.02347
Average general operation expense per customer per month	0.05636
Average depreciation and amortization per customer per month	0.02376
Average operation and maintenance per customer per month	0.46328
Average net operating revenue per customer per month	0.57712

PORTION OF THE COMMERCIAL OFFICE, SHOWING THE EQUIPMENT USED IN KEEPING THE ACCOUNTS OF OVER 25,000 CUSTOMERS OF THE REFUSE COLLECTION DEPARTMENT, CITY OF TACOMA

Sewage Statistics

The 1931 Municipal Index contains, in the section devoted to Sewers, Sewerage, and Sewage Disposal, 38 pages of "Statistics on the Collection and Treatment of Sewage and Trade Wastes" for a total of 1,422 cities in the population groups of over 1,000, of the United States. In addition to the wealth of general details, there are voluminous notes giving highly specialized information regarding plants where exceptional conditions prevail.



MAP OF CITY AND ENVIRONS, SHOWING COMPARATIVE LAND VALUES
1, Municipal Airport; 2, University Group; 3, The City Parks; 4, The Railroad Yards; 5, The Fair Grounds

Why Not Pay for City Planning by the Land Values It Creates?

A Demonstration of What Would Happen If the Planner Could Adjust Necessary Improvements to the Probable Resulting Enhancement of Land Values

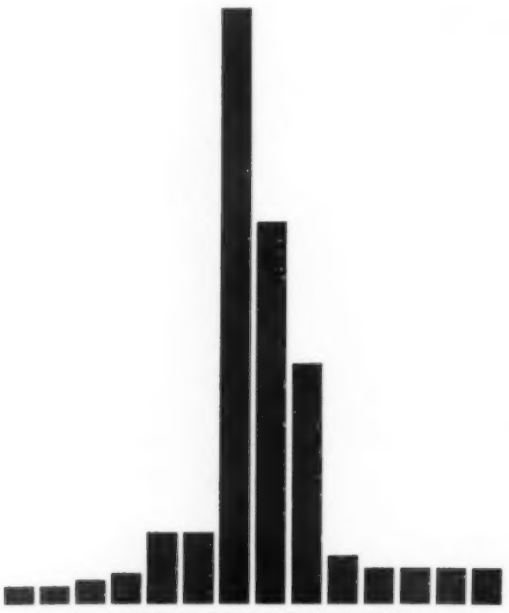
By **GLENN N. GARDINER**
Student City Planner

THE purpose of this research problem is to illustrate the possible effect upon the city planner's work, were he given authority to use the land values arising from it, to pay for the improvements he suggests. It is a frank and truthful experiment based upon actual investigation of present-day conditions in a typical American city of 18,000 population. The same principles would, it is believed, work out in similar results in a city of 8,000, or 8,000,000. The experiment deals with the estimated bare land values exclusive of all but public improvements. Figures given were obtained from realtors, landowners, a credit exchange, and the county assessor's files. The estimated values were obtained from an average of these various quoted values. Those received from realtors and landowners were naturally higher than those which might be called "true" values, and those received from the credit exchange and the county assessor were in most cases probably lower.

An average lot, 50 x 100 feet, was selected in each block and its value thus estimated was represented by a section of tubing, of which ¼-inch of height would be equivalent to $1,000 in land value. These sections of tubing were mounted in their respective places upon a map of the city. Various areas were left vacant so that a comparison of values could easily be made. The little black line across certain of the surrounding lower sections of tubing indicates the city limits.

While this map is practically self-explanatory, attention may be called to a few special areas and circumstances where city and state improvements have been made; for instance:

1. *The Municipal Airport.*—The airport has increased land values immediately adjacent thereto, the land, little of it at present occupied, being held for speculation. While noise, smoke, and wind from planes has decreased desirability for homesites, there is reasonable expectation of future need for adjacent locations for specialized pur-

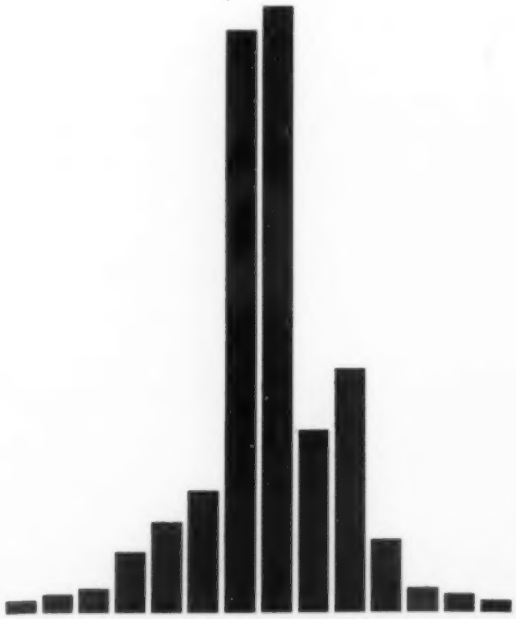


BUSINESS DISTRICT—EAST-WEST

Land values on a street through the business district crossing the main street at right angles

poses in connection with airplane service. While the benefits of the airport are general, and are paid for out of public funds, that part of the benefit which appears in enhanced land values will largely go to landowners. Why should they not go to the public which creates them and which would go far to pay the cost of the airport?

2. *The University Group.*—The State University, built and financed by public funds, affects nearby land in the same way; in fact, it has an effect upon all the land values in the city. As the institution grows and needs more space, the taxpayers will have to pay for the increased



BUSINESS DISTRICT—NORTH-SOUTH

Comparative land values in a section on the principal street of the business district running north and south. In this and the other charts on this page 1/16-inch equals $1,000

land values which their own earlier investment has created. How is it possible, under existing tax laws, for the city planner to select a school site that will not give some a disproportionate benefit in land values?

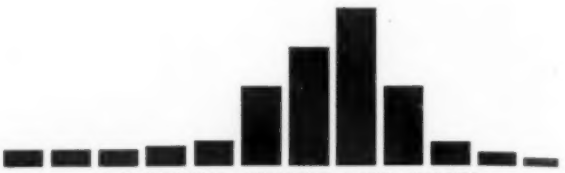
3. *The City Parks.*—In the same way, parks create land values. Parks and playgrounds are results of public expenditures, supposedly made for the benefit of all, yet the enhanced values of city lands, near and far, which are received by landowners, would pay for and maintain parks of far greater areas.

The highest land values in a city usually are concentrated within a comparatively few blocks, on neighboring business streets. Great reduction in land values is to be noted within a short distance outside of such concentrated areas. All citizens contribute to these land values, but landowners receive them, save for the relatively small percentage allotted for taxes. The values thus received would build and pave many miles of city streets. Even the building of the public highway similarly affects land values, as may be seen on the map, where a street, leaving the "peaks" of the concentrated district, cuts across town toward the railroad yards.

Certain commercial sites, even where outside the city limits, having all the benefits of rail and highway transportation facilities, city lights, water, gas, and telephone

STATE UNIVERSITY DISTRICT

Land values on section taken through university group



RESIDENTIAL DISTRICT LAND VALUES

Section taken through the most exclusive residential district

service, show the same benefits accruing to landowners at the expense of the people contributing the public funds to supply these advantages.

The most exclusive residence district, located on an elevation overlooking the city, shows the enhancement of land values resulting from natural location, from which the landowners benefit in the same fashion.

The profession of city planning would be able to establish itself as a scientific undertaking if the city planner could adjust necessary improvements to the probable enhancement of land values which his proposals, if carried out, cause. This he cannot do today. Therefore, until some arrangement can be inaugurated that will enable the city planner to work intelligently and effectively, his task of planning or replanning cities will meet with serious economic handicaps.

The purpose and aim of city planning should be, presumably, to promote better living conditions, health, morals, and the general welfare of the community. To achieve this purpose, ample funds would be available by collection of the publicly created value known as ground, or economic rent, whereby every man would be able to enjoy the increment of land values created by his presence in the community, to which, it would seem, he is entitled.

Brick Fillers and Bedding Courses —Past and Present

By JOHN S. CRANDELL
Professor of Highway Engineering,
University of Illinois

PAVING brick were first made and used in 1870 in the United States. A brick pavement was laid in in 1883 in Wheeling, W. Va., on a foundation of tarred boards. Over these was a 1-inch sand cushion on which the bricks were laid. It is probable that the use of tar for the plank foundation induced engineers to try coal tar pitch for the filler. This material had been used for some years as a roofing compound and was known to be waterproof and very adhesive. Many miles of pavement were laid with coal tar pitch filler. Then came the use of cement grout, and for a number of years the battle waged fast and furious between the tar and the cement interests as to the relative values of these materials. Soon asphalt entered the field, and it is now the accepted filler.

The National Paving Brick Manufacturers Association favored the use of cement grout for many years, and some of the best brick pavements in this country were laid with grout filler. Unfortunately it is also true that the worst failures were those which were grout-filled. The failures soon began to outnumber the successes, so that after a period of careful scrutiny of existing jobs, the manufacturer decided that pavements with soft filler were in general the best.

Experiments with Soft Fillers

A tour of inspection of block pavements in New York City disclosed that several fillers such as coal tar pitch and gravel, coal tar pitch and sand mastic, asphalt and sand mastic, straight asphalt, and a special mixture of coal tar pitch and asphalt cement mixed with sand were used. Despite the fact that the best jobs seen were those of the last type, namely, the pitch-asphalt-sand mastic, the committee of inspection decided on adopting a straight asphalt filler. Some modifications have been made in the original specifications, but in general the filler today is the same one that was adopted a dozen years ago.

From time to time experiments were tried by some of the more enterprising materials companies. It was recognized that the fillers in use were not the ultimate word. Competition made the manufacturers do some investigating. A filler that was tried out in Cleveland was made of coal tar pitch and wood flour. It was a patented material. Once it was in the joints, it gave a very good account of itself, although it was difficult to heat and apply. It also added about 10 cents a square yard to the cost of the pavement and therefore it was not regarded with great favor. Mixtures of bitumen and infusorial earth were tried with varying degrees of success. Attempts were made to incorporate sulphur with bitumen. One material that had considerable promise of success was made of linseed oil residue, cotton seed oil refuse and either asphalt or coal tar. This produced a rubbery filler that was ideal, except that at temperatures between 15 and 23 degrees Fahrenheit it was as brittle as glass. Attempts were made to use asphalt emulsion and sand as well as tar emulsion and sand, but the emulsions shrink too much and leave the joints only partly filled. Flue dust mixed with asphalt has been tried with success, but it is too expensive and there is no appreciable difference between it and an asphalt mastic. Asbestos has been mixed with tar or asphalt successfully, but these mixes also are expensive and no better in the long run than the bituminous sand mastic. Attempts have been made to stiffen coal tar pitches by incorporating coal tar coke. The resulting mix is difficult to handle.

The Qualities of Various Fillers

In certain localities, it is possible to use sand filler with some degree of success, but it would be a waste of time to argue that the material has any claims to universal use. Its defects are so many that it is not worth while to enumerate them. Coal tar pitch has been used for many years and is still used. It has some excellent qualities such as ease of application, low temperature at which it is fluid enough to use, great adhesive and waterproofing qualities, and the certainty with which it flows to the bottom of the joint. It has two defects which are serious—it is brittle in winter and it flows in summer. The former used to be more serious than it is now, because horse-drawn traffic chipped it loose from the bricks in cold weather, but this is not apparent at present when rubber tires predominate. The undue softening in summer is a real defect and many a pavement has lost much of its filler because the sun was too hot for too long a time. When the mastic type was introduced, it was found that the addition of sand had stiffened the filler to such an extent that objectionable flowing was eliminated.

City Engineer Brodie of Liverpool originated the mastic idea. His filler consisted of coal tar pitch, creosote oil and sand. To those not familiar with the industry, it has always seemed that the creosote oil must be the factor that turned the trick and made the English work better than ours. The fact is that the cresote is used solely to cut back the pitch and soften it to a workable consistency. Such superiority as may be detected in the English work is due to careful workmanship alone, and it is probable that American straight-run pitches would produce better results in Liverpool than their own cut-back pitches. The mastic consists of pitch and sand in equal volume. The sand is very hot and the pitch is sufficiently warm, about 225 degrees Fahrenheit, to make it fluid. The mastic is mixed on the job by backing the wagons containing the ingredients against each other. The hot materials are received in a hopper, where they are quickly mixed and then immediately spread on the blocks, to be squeegeed into the joints. The resulting pavement is a model. The filler is excellent and the usual defects of coal tar pitch are minimized.

The earliest use of tar mastic for brick was an alley pavement back of Franklin School, Columbus, Ohio. Repressed brick were used and no trouble was experienced in introducing the filler into the joints. This work was done in September, 1915, and the job was and is a success. It

was followed by other jobs in Ohio, and soon there were many miles of so-called mastic; "so-called" because many of them were far from what they should have been. It is relatively easy to prepare first-class mastic filler in large cities where permanent sheet asphalt plants are available in which to heat the sand. It is an entirely different matter to try to prepare such a filler on a rural road where portable heaters must be used, where the haul is long, and where weather conditions may be such as to completely discourage the most optimistic contractor.

Although pitch was first in the field, asphalt soon was used as a mastic-making material. It seemed to have some advantages over pitch. After a short time it was decided that if the penetration of asphalt was kept between 30 and 70 at 25 degrees Centigrade, there would be no need of sand, since the asphalt had no tendency to flow nor to chip as pitch does. The cost of the filler was thereby reduced and the contractors were pleased.

Meanwhile, New York City was experimenting with a mastic made of a mixture of coal tar pitch and oil asphalt. The proportions were about 80 per cent pitch and 20 per cent asphalt. This formula really was an old one that had been in use in Brooklyn in the nineties, except that at that time Trinidad asphalt was required. The idea of the mixture was that the good qualities of both materials would be available and their defects would be eliminated. The question probably arises as to why the proportions given were selected instead of a half-and-half mixture. The answer is that a homogeneous mixture cannot be made if the proportion of asphalt is increased above 20 per cent.

In 1917 the borough of Brooklyn, N. Y., specified this material. It was mixed with an equal volume of hot sand, and the filler so produced was excellent. The committee of the National Paving Brick Manufacturers Association agreed that this filler was the best they had seen, but it cost a little more. Another item against it is that any old pitch and any old asphalt that the manufacturers have on hand and wish to dump on the market may not produce the mixture which is essential. Careful selection and manipulation of the ingredients is necessary or the resulting mixture will produce an unsatisfactory filler. Properly prepared and used, this filler would be excellent for brick pavements without the addition of sand.

Current Specifications for Asphalt Filler

The current specifications for asphalt filler call for a ductility of not less than 10 and not more than 30 at 45 degrees Centigrade. This is different from the original, which allowed not less than 3. The change is said to be due to the inability of the workmen to fill the joints of plain wire-cut brick with short asphalt. It is said that the more ductile material actually fills the joints, whereas the less ductile variety merely "butters" the top. It is admitted that such trouble does not exist if lug bricks are used. The less ductile or blown type is not specified at present, although there are many existing pavements of considerable age in which such filler was used successfully.

The Behavior of Fillers in Practice

In 1929, Colonel Robert S. Beightler stated:

"Grout fillers have been practically abandoned in Ohio, on account of the tendency of grout-filled pavement to crack and blow up, but lately some attention has been given to designing the surface course with a view to overcoming these objections. One scheme that has been tried is to fill about five courses of brick with a bituminous filler at intervals of about 50 to 60 feet. This looked good in theory, but in practice the bituminous-filled sections failed, either due to expansion stresses or to unequal impact. Another design provides for a ¾-inch premolded asphalt joint at intervals of 50 feet and a ¼-inch premolded joint along each curb. A similar design was built near Cleveland about 1926 and has proved very satisfactory."

Colonel Beightler's description very well fits the brick paving work on U.S. Route 22 immediately west of Pittsburgh. This pavement was laid in 1928 and 1929. The general conclusions regarding this pavement, which has both kinds of fillers and expansion joints, are given in the Proceedings of the National Paving Brick Manufacturers Association for 1930, as follows:

1. In general the sections of soft filler show up better than those with grout filler.

2. There is no more skidding of cars on the grout-filled section than on the bituminous-filled section.

3. Grout should not extend to the curb, but a bituminous filled joint should be placed there. All cracks adjacent to the header curb should be filled with a soft penetrating material as well as all loose sections in the grouted areas.

4. No grout should be spread over the expansion joints.

5. Any crack in the brick surface seems to be more serious in the grouted sections.

6. In practically every case, a crack or joint in the base shows up through the brick surface and creates a more unfavorable condition in the grouted sections.

7. Longitudinal cracks in the base course show up through the surface by opening the cracks between the bricks in soft filler sections and by longitudinal cracks in the grout-filled sections.

Removing Excess Asphalt from Surface

The removal of excess asphalt from the surface of a brick pavement causes a great deal of trouble. An adhesive material like unblown asphalt is very difficult to remove from a brick top, especially after traffic has been ironing it into the surface. It has been suggested that some material may be sprayed over the bricks before the filler is applied and that this sprayed material will be of such nature that it will readily permit the cleaning-off of the excess asphalt. Treatment of the surface of the brick with sodium silicate or water glass will permit the peeling-off of the asphalt. Whitewash performs a similar function. All of these of course add to the cost.

Bedding Courses

Brick pavements sometimes are rough riding. If we carefully examine them, we shall find that the surface is uneven because what is underneath is uneven. Either the base has failed or the bedding course has shifted or both have occurred.

The plain sand bed has had its advocates for many years. Despite its bulking when damp and its shrinking when dry, there are still many who prefer it. The sand bed has caused more trouble to brick pavement than all the other factors combined. Some engineers have used a cement-sand cushion and claimed that it was better than

straight sand. Others have used granulated slag and claimed that it never set up. Perhaps it never got the moisture necessary to make it set up. Properly installed, either cement-sand or granulated slag is a great improvement over plain sand. Each keeps its shape once it has set, and does not run away through cracks in the base.

Some engineers have complained that brick laid on a cement sand bed crack and spall during rolling. This is often true if the bed was rolled before the brick were laid. The brick appreciate a good, soft bed as much as a human. It is the cracking of the base and the subsequent loss of sand cushion through these cracks that has made so many pavements rough. Furthermore, the bulking action of the sand, with consequent heaving of the bricks and the shifting of the bed, have not helped matters. Cement-sand and granulated slag are distinct improvements, but they leave much to be desired if soft filler is used. Since they become rigid and anvil-like in their action, many bricks are shattered by impact because they are resting on a non-yielding material.

Tar-Sand Cushions

In 1920 a tarred sand cushion was tried out in Syracuse, N. Y. Two wood block pavements were to be laid. It is well known that this type of pavement has a habit of bulging, waving, pushing, expanding, contracting and misbehaving with every change of weather. In Syracuse a concrete base of the usual design had been laid and finished with a fairly rough surface. The cushion course consisted of sand mixed with light refined tar. Except for laboratory experiments, there was no precedent, but it was thought safe to start with 10 per cent of tar and 90 per cent of sand by weight. The mix was weighed and made in the local sheet asphalt plant. Hot sand and coal tar were first used. The first truck load spread well but appeared to be too rich. The amount of tar was decreased until it was found that the best mix was with 7 per cent tar.

In using a tar-sand cushion, it should be carefully spread or luted. It cannot be rolled with anything heavier than a tennis court roller. The blocks are laid on the luted cushion and are then rolled into it. A recent report from the City Engineer's office shows that the cushion performed 100 per cent and there are no defects in the pavement due to cushion failure. The Bates Test Road in Illinois had a section of brick laid on a tar-sand mastic cushion, and it is said to be the best section of brick in that experimental road. In 1923-24 about 60,000 yards of brick pavement were laid on a tar-sanding bedding course in Mattoon, Ill. A recent investigation showed the entire yardage to be in excellent condition. Another and more recent job was that in Olean, N. Y., in the summer of 1930. A similar cushion was used on the new steel base brick pavement at Springfield, Ill. In this case a tar cut-back was used which cost more than a straight-run light tar and is not so good.

Conclusions

It would seem that we now have sufficient data at hand to be able to go ahead with the construction of brick pavement to the end that definite improvements will be introduced which will really eliminate those features that have been detrimental to the best interests of this type of paving.

ACKNOWLEDGMENT.—From a paper presented before the twenty-fifth annual meeting of the National Paving Brick Manufacturers Association.

Municipal Auditoriums*

By EDNA TRULL

WHATEVER may be the picture in the mind of the local citizen, the municipal auditorium in one or another of its various forms is an important civic institution in many American cities. Its development is the result of a diversity of influences. The physical attractiveness of the city is enhanced by such an addition to its public buildings. Making a town a social and cultural center for the region is good business. Offering a center of community activity is sound civic education. Having fine buildings is good publicity. Thus the auditorium movement has grown. The town hall where villagers met to give their opinion on civic matters was sometimes used for other occasions. Local organizations found the large hall convenient for their public gatherings and local needs gradually developed.

Material collected from 119 cities ranging in size from less than 1,000 to more than 900,000 population in 37 states is naturally varied, but the number and importance of municipal auditoriums necessitates their consideration as part of American municipal life, and such consideration reveals that the oldest and newest, the largest and smallest have something in common. Many of them, for instance, have decided that the existence of a municipal auditorium warrants a steady charge against the treasury. The advantages, to be sure, are likely to be among the intangibles. Only the large and very flexible buildings are covering their cost with receipts. This is not, however, the major factor. A public building of any size which is attractive and frequently used and is the social civic and cultural center of the town deserves a recognized place on the debit side of the financial ledger. If, besides, its construction makes it a recreational center, its value is increased.

Some buildings are constructed with all of this apparent. The many which are not obviously such, however, may have potentialities as great as the most important and popular civic center in the country. The realization of this demands a kind of vision which cannot be expected of every offical to whom the care of the buildings may happen to fall. The physical supervision of an auditorium building is less important than the direction of its place in the community. The primary qualification, therefore, for the person who is to be the controlling factor is an interest in making the building worthwhile. This may be found in a building superintendent who happens to have imagination, it may be in a subcommittee of the council, it may be in an independent board of citizens interested in a well-rounded program of community development, or it may be in a manager who has partial or complete authority.

The community is rare which does not have some of its social civic, recreational and cultural activities housed in private buildings. It is not necessary to enter into competition with these if they are operating satisfactorily, but there are many cities where there is still not adequate provision and where the municipal auditorium building remains an unattractive place used only for occasional public meetings and for one or two annual events because it happens to be the only place large enough. The idea of a community center may be a comparatively new one. The emphasis on the social and cultural needs of a people has received much recent academic discussion, but the practice and reality of the old village green or of an active guild house is appropriate to communities of all sizes. The justification of a municipal auditorium lies in its contribution to civic development.

* For a listing of the publication of the above title from which this article is taken, se page 129, August issue.

The Tarrytown Experiment

A Community-wide Effort to Abolish Speakeasies, Gambling and Vice

By **EUGENE H. LEHMAN**
Mayor of Tarrytown, N. Y.

RIP VAN WINKLE helped make Tarrytown a village that appeals to the imagination of every American schoolboy. But weak-willed Rip did like to take many a sip in the good old Colonial days. And there are now living in Tarrytown not a few men and women who bear the proud family name of Van Winkle. But there are many, many more now living in our midst who, although they do not bear this romantic family name, have none the less either inherited from other ancestors or acquired of their own initiative the tendency to take a little sip here and a little there until, after having dozed off into a troubled sleep, they finally awake feeling themselves twenty years older.

Now the modern authorities in Tarrytown are not seeking to enforce prohibition, although we are very willing to cooperate with the Federal officials in trying to bring about its enforcement. We are not posing as moral reformers nor as crusaders inspired by a "cause." On the contrary, we are just a group of plain, ordinary American citizens who love our community and who feel that this community offers a particularly appropriate place in which to attempt a modern experiment in an old-fashioned type of self-government.

Tarrytown is a good village. Indeed, it probably ranks far above the average. But for us, the good is an enemy of the better; the better is an enemy of the best. We are not satisfied with something good in Tarrytown if we can achieve something better; we are not satisfied with something better, if we can possibly achieve the best. But not only is Tarrytown now a good village; its heritage in history, its heritage in literature, the natural beauty of its setting amidst the hills of Westchester on the shores of the Hudson, the social and cultural status of its people—all these things combine to make it a particularly favorable place in which to try the experiment of finding out whether citizens here really want to drive out of their borders gambling, prostitution and drunkenness.

The existing political situation offers an unusual opportunity for our experiment; for we now have a village whose municipal administration is completely free from selfish party domination. If the people of Tarrytown under these fortunate conditions do not really want to govern themselves, if they do not actually desire to drain their cesspools of iniquity, then it is possible to infer that no citizens of any American community sincerely seek to put their houses in order.

Do the People Want a Clean Village?

So, very briefly, the Tarrytown experiment is an attempt to find out whether people here or anywhere want with their hearts what they pretend to want with their lips. That is our problem, and this in outline is our method of procedure:

First, we definitely established the facts. We learned that there are about three or four disorderly houses, about five or six gambling dens, and about twenty speakeasies or "sneakeasies," as I prefer to call them, that are now, and long have been, flourishing within our village limits. We are opposed to these places not so much on churchly moral grounds as on the grounds that disorderly houses are spreading disease among innocent women and children; gambling dens are bringing poverty to the homes of those who play these games of chance; and speakeasies are breeders of graft and crime.

Secondly, instead of forthwith raiding these joints, we are seeking to focus public sentiment against them. We are anxious to get rid of these objectionable places; but we are equally anxious that the whole citizenry should participate in this ridding process. This may be the unique feature in the attempt to solve our problem; for our purpose is nothing else than to try to put cooperative government into actual practice. That is, we do not want Tarrytown to be governed by a boss or by a political party on the one hand; we know that it cannot be governed solely by the people on the other; but we hope it can be governed by democratic officials cooperating with the people.

According to the prevalent custom, a mayor, when he wills to drive law violators out of his city, merely orders his police to proceed to carry out his purpose. The people sit comfortably in the grandstand criticizing or commending the players. In Tarrytown, we aim to get the people out of the grandstand, down onto the gridiron, into the game. The purpose of cleaning up the village must be the purpose not of the mayor alone, but, in so far as is possible, the purpose of every man, woman and child within our jurisdiction. Only to the degree in which each actively participates in the process is he deriving the benefit from our type of government.

A letter was therefore written to practically every organization within the village—service clubs, civic societies, fraternal orders, educational groups, etc—inviting the members to express their attitude frankly on the program under consideration. When a sufficient number of favorable responses had been received, the writer called a town meeting to discusss the method of procedure. At the meeting a motion to express complete confidence in the plan was carried unanimously; a committee of private citizens was appointed to represent the people and to work with the elected officials; and a request was made that another meeting be held within the next two or three months to consider both this and other questions that might in the meantime arise.

A "Psychological Whipping Post"

The committee has already had three ordinances drawn up for consideration by the Board of Trustees of the village. A good deal has appeared in the public press to the effect that the committee is planning to establish what has been called a "psychological whipping post." The idea underlying the suggested plan may be briefly summarized thus. Experience has shown that raids do not

accomplish any permanent good, for they are directed against the proprietors of the illicit houses. A more effective weapon can be used if the attack is directed against the income of the business itself. Choke the income and you will throttle the law violators. Now how can you choke the income?

Well, no one has any legitimate business in a sneak-easy, in a house of ill-repute or in a gambling resort. It would be comparatively easy for the police to secure a list of those who make it a habit to frequent these places. If such a list were actually drawn up, it might be kept available for consultation by employers, by social, civic, service, or other organizations; indeed, there are several purposes to which it might profitably be put. The likelihood is that many, if not most, of the customers, would thereupon cease to visit these dens of vice. The proprietor's income would diminish and he would voluntarily retire from business. Tarrytown has not as yet adopted this method of procedure; but we should like to know whether it has ever been tried anywhere else.

We have decided not to make use of physical force unless and until we become convinced that such force is absolutely essential. We seek to play fair even with gamblers, and will at least make an honest attempt to help them transform themselves into good American citizens without leaving any feeling of resentment rankling in their bosoms; for we shall try to persuade the more amenable among them to give up their present means of earning a livelihood and shall seek to assist them in getting started in some legitimate business. We shall also bring similar influence to bear on the landlords and real estate operators.

Of course, against those who do not yield to this gentle treatment, we shall be obliged to employ more strenuous methods. It is not for me to predict what may happen. But for the moment at least, the people of Tarrytown are in complete power and will so continue for another two years. The two-year plan is their plan, and a wide public is watching the experiment with keen interest.

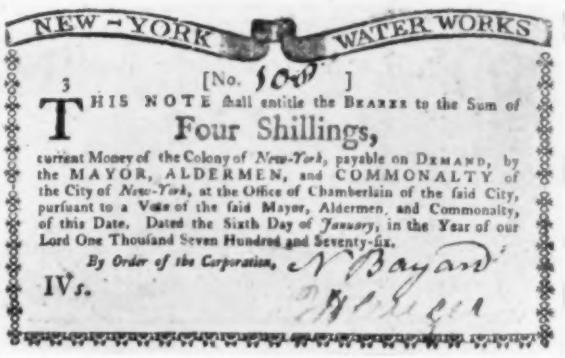
Financing Water Works in the Old Days

A Brief Story of the Scrip That Paid for a Colonial Water-Works System

A SHORT time ago the original of the four-shilling note depicted herewith come into the possession of one of the editors of THE AMERICAN CITY. Immediately a search was made to determine the life history of this interesting piece of Colonial scrip. With the help of William W. Brush, Chief Engineer, Bureau of Water Supply, New York City, and "A Memoir of the Construction, Cost and Capacity of the Croton Aqueduct," by Charles King, dated 1843, we have learned much regarding the financing of the early water works of New York City.

According to Charles King, at a very early date, the want of a sufficient supply and a convenient distribution of good water was felt by the citizens of New York. Before the Declaration of Independence, considerable expenditures had been made in order to satisfy this want. In July, 1774, the proposal by Christopher Colles* to erect a reservoir and convey water through the several streets of the city, after having been for some time before the Common Council, was finally adopted and ordered to be carried into effect.

The scheme of Mr. Colles was simply that which was afterward adopted by the Manhattan Company, namely to dig large wells and pump the water from them up into reservoirs. The ground selected was on the east line of Broadway between Pearl and White Streets, where a spacious reservoir was constructed. On August 8, 1774, the Common Council appropriated moneys to purchase the


NEW-YORK WATER WORKS

[No. 1067]

THIS NOTE shall entitle the BEARER to the Sum of

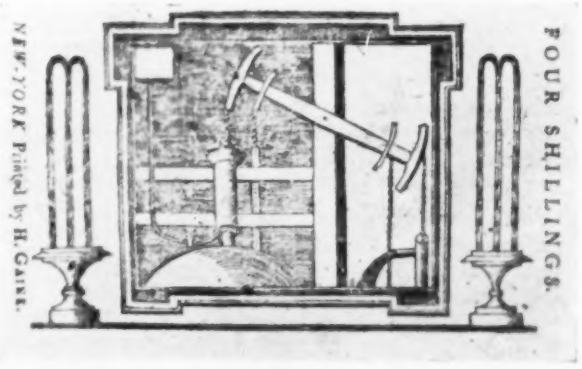
Four Shillings,

current Money of the Colony of *New-York*, payable on DEMAND, by the MAYOR, ALDERMEN, and COMMONALTY of the City of *New-York*, at the Office of Chamberlain of the said City, pursuant to a Vote of the said Mayor, Aldermen, and Commonalty, of this Date. Dated the Sixth Day of *January*, in the Year of our Lord One Thousand Seven Hundred and Seventy-Six.

By Order of the Corporation, N. Bayard

IVs.

FACE OF A 155-YEAR-OLD NOTE



REVERSE

A diagrammatic illustration of one of the early American pumping engines

* Christopher Colles, an accomplished civil engineer, linguist, and man of science, was born in Ireland of English parentage in 1738. He came to America in 1765; lectured on canal navigation in 1772, published a series of sectional road maps, assisted almanac-makers in their calculations, and engaged in manufacturing printer's colors and paper boxes. Although highly esteemed by men of science and at one time Actuary of the Academic of Fine Arts, he died in comparative obscurity in New York in 1821.

land for the reservoir at £600 per acre, with the provision, however, "that upon sinking a well there, good water be found. If not, the well to be filled up by the Corporation."

The quality of the water proving satisfactory, on August 25, the former resolution of the Board, accepting the proposal of Mr. Colles, was confirmed and Treasury notes to the amount of £2,500 were ordered to be issued to meet the expense. Four thousand notes each in denominations of six pence, one shilling, two shillings, and four shillings, and 2,500 notes of eight shillings each, were issued, bearing the date August 25, 1774. A second series was issued as of August 2, 1775, and still another dated January 6, 1776. Below, one of the four-shilling notes is reproduced. The back of the note represents the machinery by which the water was to be raised, undoubtedly one of Newcomen's Atmospheric Engines, which, since the beginning of the century, had been in general use on draining mines in all parts of Europe, and one of which, about 1760, was imported by the proprietors of the old copper mines of Belleville, N. J. According to Mr. King, this type of engine was probably seen by Mr. Colles and selected to use for raising water into the reservoir.

Page 88 of the Memoir by Charles King states that after the report of the issuance of the notes of August 2, 1775, comprising a total of £2,600, "the revolutionary struggle, which had even then commenced, and of which the city of New York felt the full effects, appears to have put an end to this enterprise for furnishing water before it made any great progress. Scarcely, however, had peace returned with liberty and national independence achieved, than our citizens again busied themselves about good water."

William W. Brush reports that about 1902 one of the New York water-works notes, issued in 1774, was presented to the Mayor of the city of New York, for redemption. The Mayor then in office advised that the note be presented to the British Government, as New York City at the time of issue of the note was under British Colonial rule. There is no record of collection.

Air Traffic Avenues

A Growing Municipal Need

By **PERRY A. FELLOWS**
Engineer-Manager,
Detroit City Airport

STUDENTS of city planning find that their work is intimately connected with the location and design of airports. Some phases of this relationship have been discussed at length at various times. These usually have to do with the location of the field, accessibility by street or road, and the application of zoning regulations to restrict the heights of nearby buildings. Another aspect of the city planning relationship which has not received the attention it merits will very probably become increasingly important in the near future. This is the provision for air traffic avenues.

Air transport traffic between major cities is increasing at a tremendous rate. Larger ships and more frequent schedules are being demanded by the traveling public. The necessity for close-in terminals is also being recognized. With the establishment of these comes the recognition of the fact that air traffic over built-up areas carries with it certain needs for which provision must be made.

The regulations of the Department of Commerce for the control of air traffic set minimum restrictions on the height at which aircraft may fly over cities, but these restrictions cannot apply to the planes landing or taking off. It is conceivable that these regulations will be extended to set up certain airport approach routes supplementing the general air routes now established. Rules might make it compulsory to follow these approach lanes to and from the airport, especially by transport operators. If such lanes for traffic are established, it will become necessary to mark these with suitable means for day and night identification.

The area under the line of flight of the plane taking off is especially worthy of attention. The usual regulations require a pilot to keep a straight course until he has reached a point 1,000 feet beyond the field, and that if he turns he shall circle the field in a counter clockwise direction until he gets the required altitude.

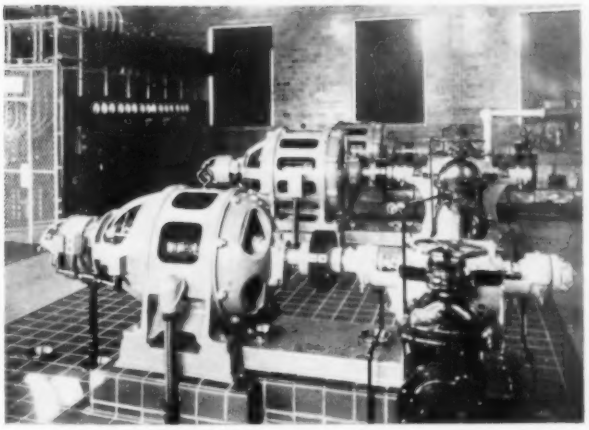
The close-in terminal often presents a peculiar problem in the character of the area over which the ships pass immediately after leaving the boundary of the field. It is also true that during this period before a safe altitude has been reached, an engine failure would present serious difficulty. Under such circumstances immediate landing is imperative, and the selection of suitable spots for such landing is almost impossible. To land on roof tops spells certain disaster.

Mapping Landing Areas

The possibility for restricted open continuous strips has been suggested. Another plan is for discontinuous areas or open spots for such emergency landings. At any rate, the immediate need is for adequate mapping of all possible landing spots in the neighborhood, whether these places are city-owned or not. This information can be given pilots of transport lines regularly operating from the airport. Later action should include marking for the benefit of strangers, and for this purpose a standard designation of universal character should be used.

The Detroit City Airport is fortunately situated in this respect, so far as most of the take-off directions are concerned. In certain directions adequate space is available for such emergency landing spots. In other directions surveys are in progress to disclose what might be done to bring about the required improvement. The study is worth the attention of city planners, airport managers and transport line operators interested in promoting the safety of air travel for the general public.

A Pumping Station Pays for Itself



INTERIOR OF THE PUMPING STATION, SHOWING THE MOTOR-DRIVEN CENTRIFUGAL PUMPS AND THE CONTROL BOARD

Savings Effected over Three-Year Period Will Exceed Cost of New Brunswick's New Plant

By **ELLIS IRVING CRONK**

AN annual saving of $20,000 in operating expenses will be the achievement of New Brunswick, N. J., through the erection of a new pumping station and the installation of electrically driven pumps. The new station has been in operation for three months, and the results over that period bear out the original estimate made by the Department of Revenue and Finance.

The City Commissioners, in adopting a progressive policy toward the improvement of New Brunswick's water supply at a minimum cost, realized that the old steam pumps had outlived their period of economical service. A year's investigation proved the costliness of their operation; the cost of repairs to the boiler, engine and pumps was high and showed that the need for a new plant was imperative. The cost of pumping had shown a steady increase until the erection of the new building with its modern equipment. In 1924 the cost per million gallons had grown to $16, and the next five years brought a further jump to $26.80. With the change to electrically driven pumps, however, the figure has been cut to $14.72, which will cause the savings over a three-year period to exceed the total cost of the new station.

Sources of Electric Power

Before deciding on an electrical station, the city had a definite understanding with the Public Service Corporation that the latter would supply two independent power lines to the plant. One of these comes from the New Brunswick substation over a wooden pole line, a distance of two miles; the other is sent from the Piscataway Township substation over the line of the main transmission on steel towers. The Public Service is tied in with neighboring power companies, so that the possibility of a failure is very remote.

Pumps

The pumps selected for the power included an American 8-inch centrifugal driven by a 200-horsepower synchronous motor, with a capacity of 4 million gallons, and two American 12-inch centrifugal pumps driven by 300-horsepower synchronous motors with a capacity of 6 million gallons each. One of the 12-inch pumps has a 250-horsepower gasoline engine which can be coupled with the pump for emergency operation. This brings the total capacity of the station to 16 million gallons per day at the highest head.

THE NEW BRUNSWICK PUMPING STATION

Architectural Treatment of Plant

The station itself is attractive in appearance and modern in every detail of its construction. The exterior is of Colonial brick with limestone trim, and the roof is of rough variegated slate. The interior walls are lined with buff-colored wall tile, and the floor is of dark-red quarry tile laid in 6-inch squares with black mortar.

The building, which is 40 x 80 feet, is provided with a boiler room and is heated with an oil burner, which is connected with two overhead fan heating units. The main suction and discharge pipes are located in the basement, where may also be found the reactors and transformers.

Construction Costs

The contracts for the work were as follows:

Pumps and electrical equipment	$24,000
Building	21,730
Plumbing and heating	3,000
Oil burner	945
Electric lighting	865

The above figures do not include the cost of the main section and the discharge pipings, as this work was done by the city force.

Control Equipment

The plant has been equipped with the most modern devices. The pumps are operated by remote control from an 8-panel switchboard. The motors, being of the synchronous type, have to be run at an exact speed in keeping with the electric current as it is furnished by the power company. The current is a 60-cycle one, so that the regulation of the speed must be accurate to the sixteenth part of a second.

History of Water Works

New Brunswick is one of the few municipalities in New Jersey that can boast of an adequate water supply. Along with the latest improvements for pumping water from the sheds to the mains, it has a fine filter plant. Developments indicate, however, that the filter plant will have to be enlarged within a short period. The watersheds of New Brunswick supply not only this city but also North Brunswick, Milltown and Highland Park, and negotiations are now under way to add Franklin Township to the list.

New Brunswick's water supply was first inaugurated by a private company in 1867. A property known as Weston's Mill, about two miles from the city, was purchased and the first pumping station built. This station had a water-power pump and a direct-acting steam pump. For many years the former was sufficient to handle the demand, the steam pump being used only in times of low water.

The original pumping main was 12-inch cement-covered sheet iron pipe. This caused considerable expense through breakage and was soon replaced by a larger cast iron main. It was enlarged until the installation of the present main, which includes two lines of 20-inch cast iron pipe.

The water is pumped to the reservoir, a distance of 8,000 feet, at an elevation of 123.5 feet above the level of the pond. The water is pumped from the filter plant, which was built in 1917, to an 85-foot standpipe for distribution. The filter is of the rapid, gravity type and has a capacity of 3,000,000 gallons per day.

The reservoir has a capacity of 2,000,000 gallons, while the clear well holds 400,000 gallons and the standpipe 800,000. In the above figures for the reservoir, only the upper part, which is available for the filter plant, is taken into consideration. By using these storage facilities, the operation of both pumping station and filter plant can be regulated to give uniformity.

Further storage has gradually been added to the original mill pond. The first additions were effected by increasing the height of the old mill dam, but, as nothing was added to the bottom of the dam, the entire structure floated away one night and a temporary dam had to be built to get the water into the suction well. A permanent dam was constructed later that year.

In 1918 an additional dam was erected, adding 4½ feet to the level of the pond and doubling the original capacity of the reservoir. In 1926 an entirely new reservoir was created upstream by building a dam 300 feet long, resulting in impounding 800,000,000 gallons of water. The total storage under the control of New Brunswick is now beyond a billion gallons, which is six months' storage at the present rate of consumption. This will be more than ample for years to come, although the capacity can be increased if needed.

The experience of New Brunswick in effecting impressive slashes in operating expenses and at the same time securing an attractive and reliable pumping station which will be entirely paid for out of its savings, may well be borne in mind by other communities, where the cost of maintaining a reliable water supply at minimum expense is ever a question of paramount importance.

Municipal Control Over Taxicab Rates

By A. L. H. STREET

THE city of Portland, Maine, recently adopted an ordinance regulating taxicabs, in which, among other provisions, it is forbidden to charge for more than one passenger. Charges must be based upon taximeters, installation of which is compulsory.

Particularly interesting will be any court decision that may determine the effect and validity of the clause which permits charging of but one fare, although two or more passengers may be carried. Is such a provision valid? If it is, may a taxicab operator refuse to carry more than one passenger at a time? If Hubby and his wife want to be taxied from their home to the railway station, or home from a party, may a taxicab driver refuse to carry both of them unless they pay two fares?

There are several appellate court decisions upholding municipal taxicab regulations, but our attention has not been drawn to any precedent directly supporting the right of a city to limit the charge to one fare when two or more passengers are carried, excepting the decision of the New York courts in the case of *Yellow Taxicab Co. v. Gaynor*, 143 N. Y. S. 279 and 144 N. Y. S. 299. It was decided that an ordinance was not invalid as being unreasonable nor as providing for a confiscatory fare in providing: "For not more than two passengers for the first half-mile or any portion thereof, 30 cents, and for each succeeding one quarter-mile or any portion thereof 10 cents."

The opinions in the same case are the leading authority supporting the municipal right to compel installation of taximeters.

The power of cities as to fares seems to depend somewhat upon the nature of charter or statutory powers given to the governing bodies. Where there is no charter or statutory provision to restrain a municipal legislature, there is reputable authority for saying that an ordinance may prescribe conditions, reasonable or unreasonable, on which taxicabs may be operated.

To illustrate, an ordinance regulating taxicabs was upheld by the Georgia Supreme Court, under charter power to provide for the welfare of the city as deemed best, etc. (*Clem v. La Grange*, 149 S. E. 638.) The Court said:

"Individuals do not have the inherent right to conduct their private business in the streets of a city. A city can prohibit the owners or operators of taxicabs and busses from transporting passengers for hire in such vehicles upon the streets of the city. The transportation of passengers for hire in such vehicles or otherwise is a privilege which the municipality can grant or withhold. . . . And as the city can prohibit wholly or partially the conduct of such business in its streets, if the city sees fit to grant permission to individuals to conduct such business in its streets, it can prescribe such terms and conditions as it may deem fit, and individuals desiring to avail themselves of such permission *must comply with such terms and conditions, whether they are reasonable or unreasonable.*"

But it will probably be found that, under some charters or acts governing cities, cities have regulatory but not prohibitory powers over taxicab operation. In such cases, it is obvious that regulatory measures must be reasonable.

The following cited court decisions as well as those above cited, have bearing upon this subject: *Ex parte Tarling*, 241 S. W. 929, decided by the Missouri Supreme Court; *Commonwealth v. Gage*, 114 Mass. 328; *State v. Dillon*, 89 So. 558, decided by the Florida Supreme Court.

How Adequate Are Municipal Engineers' Salaries?

By **F. J. SETTE**
Associate Professor of Sanitary Engineering, Virginia Polytechnic Institute Blacksburg, Va.

WHAT salary should an engineer receive in order to live at a professional standard? Piexotto in his book "Getting and Spending at the Professional Standard of Living" shows that the mean expenditure of a professional man (in his case, college professors) is $4,893.22 a year (for a family of four). An article, "Standard of Living of a Professional Man's Family in 1816-17 as Compared with 1926-27," by Chase Goiny Woodhouse in the *Journal of Political Economy* for October, 1929, and *The Monthly Labor Review* for December, 1929, supports Piexotto. The expenditure in this case, for the same number in the family, was $4,853.83. It seems then that $4,875 a year is necessary as a mean return in order for a professional man to live in a professional style.

Engineers' salaries are difficult to determine. This study was made on salaries of engineers engaged in municipal and Federal work. The data were taken from *The Municipal Index* for 1930 and from the booklet, "Opportunities for Engineers in the United States Civil Service," issued by the United States Civil Service Commission. The results of the statistical study may be tabulated as follows:

TABLE I

Occupation	No. of Cases	Per Cent Earning Stated Yearly Salary or Less 10%	25%	50%	75%	90%
City Manager	367	$2,600	$3,300	$4,200	$5,500	$7,000
Federal Engineer	3,536	2,250	2,700	3,200	4,000	4,700
City Engineer	585	1,750	2,300	3,100	4,200	5,400
Water-Works Supt.	441	1,950	2,450	3,100	4,000	5,000

If we assume that $4,875 a year is the expenditure of a professional man, let us see what per cent of the engineers are earning this salary or more in the various groups.

TABLE II

Occupation	Percentage Earning More Than $4,875 per Year
City Manager	36%
Federal Engineer	8%
City Engineer	15%
Water-Works Supt.	11%

The engineer who works for the city or government is therefore receiving a median salary well below the median professional expenditure.

The study was carried further to determine the relationship between the salary of the engineer and the size of city. For this purpose the cities were arranged in several groups and the average population for each group determined.

The median salaries in the various groupings for city engineers, water-works superintendents and city managers were plotted against average population, the resulting curves showing a decided correlation between salary and size of city. From these curves it was determined that the median salaries paid in cities of various sizes are as follows:

Size of City	Median Salary per year for City Managers	City Engineers	Water-Works. Supts.
10,000	$3,750	$2,180	$2,250
25,000	5,400	2,850	2,850
50,000	7,000	3,500	3,450
100,000	9,200	4,300	4,100
500,000	17,250	7,000	6,300
1,000,000	25,000	8,700	7,600
Maximum salaries reported	25,000	15,000	24,000

EDITORIAL NOTE.—The gap between desire and reality with regard to remuneration for work done is likely to be great in any walk of life, and certainly the municipal engineer provides no exception.

Professor Sette, in the accompanying brief study, has not attempted to measure this discrepancy, but endeavors to show the most representative actual salaries for various groups of municipal technicians, compared with a professional standard derived from other studies.

The salary figures were obtained largely from the 1930 Municipal Index, as this study was made just prior to the appearance of the 1931 edition. Use of the latter figures would not greatly affect the results, however. As salaries of municipal engineers have reacted somewhat to the current economic depression, the level would in general tend to be lower, and the percentage of those exceeding the standard would be decreased.

Britain to Tax Land Values

BEGINNING with the fiscal year 1933-1934, all land in Great Britain, subject to certain exemptions, is to be taxed annually at the rate of one penny for each pound of the land value of every land unit, according to the Finance Act effective July 31, 1931. The first land valuation is to be made January 1, 1932, the second August 1, 1936, and others thereafter every five years. This new tax for national public revenue is in addition, of course, to local rates; and these in Great Britain are assessed not on real estate valuations, but on the income derived or derivable from current use.

Roughly, the land value of any land unit is interpreted in the new law to be the amount for which the land alone, without improvements, would sell in the open market on the valuation date, without taking into account the value of any minerals the land may contain, or the felling value of any trees, or the value of any shooting or fishing rights.

In the case of agricultural land, both land value and "cultivation value" are to be ascertained, and the tax will be charged on the amount by which the former exceeds the latter. Therefore, if the cultivation value of a piece of property exceeds its land value, no tax will be charged. Small proprietors whose individual total taxes do not exceed ten shillings a year are relieved from paying the tax.

Playing fields, public parks, churches and church yards are exempt, as are also lands publicly owned or belonging to railways or other public undertakings, including units held by low-cost limited-dividend housing enterprises. In the case of playing fields subsequently changed to a taxable use, the act stipulates that "the tax chargeable in respect of the unit for the first complete year of charge for which the tax becomes chargeable in respect thereof shall be multiplied by five or by the number of complete years of charge during which the unit has been so exempt as aforesaid, whichever is the less."

The Community's Fundamental Right to the Land

In his speech winding up the debate on the bill in the House of Commons, Chancellor of the Exchequer Philip Snowden said:

"The principle underlying this bill is to assert the right of the community to the ownership of the land. I have never made any question about that, nor that that right should be expressed in the form of a rent paid by the occupier or, rather, the owner of the land to the community. As I said just now, this is only the first step in the reform of our land system. The effect of that system has been to place a burden on industry of hundreds of millions a year. It has crowded our people into pestilential slums, and it has driven hundreds of thousands of people from the land into the towns to compete with the town workers, with the result that wages have been depressed and unemployment has been increased.

"I commend the bill to the House of Commons not only upon its financial proposals but also upon its land proposals. I think that when they come into operation their social and economic effect will be seen, but it is only the first step.

"The party for whom I speak have always put the question of land reform in the forefront of their programme. Although I may not live to see the step that we have taken this afternoon advance still further, at any rate I submit this bill to the House of Commons with the satisfaction that I believe that we have begun a far-reaching reform which some day will liberate the land for the people and abolish once and for all the tyranny under which . . . [they] have suffered."

Achievements in the Battle Against Typhoid

THE honor roll of cities of over 100,000 population in which there were no deaths from typhoid fever during 1930 is: Bridgeport, Conn.; Jacksonville, Fla.; Kansas City, Kans.; New Haven, Conn.; Paterson, N. J.; Peoria, Ill.; South Bend, Ind.; San Diego, Calif.; Utica, N. Y.; and Worcester, Mass. Cities of the first, second, third and fourth ranks in the death roll, with mortality percentages as stated, are given in the following table.

DEATH RATES FROM TYPHOID IN 1930 *

First Rank (from 0.1 to 1.9 Deaths per Hundred Thousand)

Newark	0.2	Lynn	1.0
Jersey City	0.3	Oakland	1.0‡
Milwaukee	0.3	Portland	1.0
Dayton	0.5	Waterbury	1.0
Syracuse	0.5†	Detroit	1.1
Chicago	0.6	Akron	1.2‡
Flint	0.6†	Minneapolis	1.3‡
Grand Rapids	0.6†	San Francisco	1.3
Long Beach	0.7	Des Moines	1.4
St. Paul	0.7	Scranton	1.4
Springfield	0.7†	Cleveland	1.5
Yonkers	0.7	Los Angeles	1.5‡
Albany	0.8	Pittsburgh	1.5‡
Boston	0.8	Louisville	1.6
Chattanooga	0.8	Spokane	1.7‡
Cambridge	0.9	Miami	1.8
Erie	0.9	Rochester	1.8
New York	0.9	Wichita	1.8
Omaha	0.9	Buffalo	1.9
Philadelphia	0.9	Canton	1.9
Reading	0.9	Indianapolis	1.9
Tacoma	0.9	Knoxville	1.9
		Somerville	1.9

Second Rank (from 2.0 to 4.9)

Duluth	2.0‡	Columbus	2.7‡
Providence	2.0‡	New Bedford	2.7
Denver	2.1	Salt Lake City	2.8‡
Toledo	2.1	Tampa	3.0‡
Tulsa	2.1	Baltimore	3.3‡
Kansas City, Mo.	2.2‡	Washington	3.3
Richmond	2.2	Houston	3.8‡
Seattle	2.2‡	Norfolk	3.8
Youngstown	2.3‡	San Antonio	3.9
Cincinnati	2.4	Camden	4.2‡
Hartford	2.4‡	Elizabeth	4.4‡
Trenton	2.4‡	Birmingham	4.6‡
St. Louis	2.5	Memphis	4.7‡
Fall River	2.6	Wilmington	4.7
Fort Wayne	2.6	Fort Worth	4.9‡

Third Rank (from 5.0 to 9.9)

Lowell	5.0	El Paso	6.8
Dallas	6.5‡	Evansville	6.8
New Orleans	6.5	Oklahoma City	7.0

Fourth Rank (10.0 and Over)

Atlanta	10.3‡	Nashville	12.3‡

This report, taken from the *Journal* of the American Medical Association, concerns 93 cities of more than 100,000 population according to the revised figures of the 1930 census given out on January 17, 1931. The number of typhoid deaths during 1930 has been sent in by the health department of each city and includes all typhoid deaths within the city limits, non-residents as well as residents.

Attention is called to the remarkable record of New Haven, which has had only two deaths from typhoid in four years, "after being one of the 'tail-enders' for nearly twenty years." The highest honor for 1926-1930 in the group of 14 New England cities belongs to Springfield, with only three deaths in five years. The cities of the Middle Atlantic States make the best showing of any geographic group in 1930. Every one of the 18 cities made a better record in 1926-1930 than for the previous five years. Both New York and Philadelphia reduced by half their typhoid rates in the second five years. In the East North Central group Peoria, a newcomer, in the list, reports only one typhoid death in seven years, a record which is stated to be apparently unequaled in the country.

The following comparison of three items showing the total typhoid rate for 78 cities is striking:

Year	Population	Typhoid Deaths	Typhoid Death Rate Per 100,000
1910	22,573,435	4,637	20.54
1920	28,244,878	1,088	3.85
1930	34,386,717	554	1.61

* Note that the ranks have been arranged differently from those in the corresponding tables of previous reports. Formerly the Honor Roll included all cities with rates from 0.0 to 1.9. The new arrangement puts into Second Rank the cities that used to be called First Rank, and the new Third and Fourth Ranks correspond to the old Second and Third.

† The single typhoid death reported was stated to be in a non-resident.

‡ One third or more of the reported typhoid deaths were stated to be in non-residents.

Preventing Athlete's Foot

"ATHLETE'S foot" sounds like something worth getting—a physical feature for which one might go in training—but it isn't. Quite the contrary—it is, says the Aetna Life Insurance Company, of Hartford Conn., in Health Article No. 167, a prevalent infection of the feet caused by contamination in swimming pools, baths, gymnasiums, etc., the result of a fungus which develops on the floors of such places and resembles the mold that sometimes forms on foodstuffs kept in hot, moist rooms. The spores from this fungus lodge on the feet, particularly if there is a break in the skin.

To prevent the occurrence of the fungus on the floors of gymnasiums and in the vicinity of swimming pools and baths, these surfaces should be washed thoroughly and frequently with soap, hot water and a reliable disinfectant, and then dried carefully, particularly in corners and out-of-the-way places. This obvious procedure, together with sunlight and good ventilation, will retard the growth of the fungus.

Aeroplane Sewage Disposal

OLD problems repeat themselves in relation to the perfecting of the facilities of this marvellous age. A serious one is discussed under the title above in the August issue of the *American Journal of Public Health*, by Howard H. Bell, M. D., of St. Louis, Mo. Dr. Bell says:

"I have recently undertaken an aeroplane trip of approximately 2,000 miles. A toilet was available in the planes, for the use of the passengers, which consisted of a modern and comfortable seat, over a lower opening of about 6 inches in diameter which led to the great open space between the plane and the earth below. There was also a washbowl in one corner from which a drain pipe emptied into the side of the toilet bowl.

"Railroads contaminate the soil notoriously over a definite course which is taken into consideration when planning the water supplies for villages and cities. Aeroplane traffic may contaminate any region, any water supply, and indeed any reservoir, in view of this promiscuous distribution of human excreta.

"It seems urgent that public health authorities take immediate action to eradicate this menace to pure water supplies over our entire country. I have observed a detachable vessel to receive human excreta in British passenger planes, and corresponding or equivalent precaution should be practised by American aeroplane companies."

Financial Statistics of Cities: 1929

THE Bureau of the Census, Department of Commerce, has announced the following summary of the financial transactions of the 250 cities having a population of over 30,000 for the fiscal year 1929. These statistics cover the government of the city corporation proper, and also independent school districts, sanitary districts, park districts, and other independent districts practically coextensive with the cities. They also include a per cent of the financial transactions, debt, and tax levies of the county governments for cities having over 300,000 population, in order that the statistics for such cities may be comparable with those for other cities in this class in which the ordinary county functions are performed by the city government.

The payments for operation and maintenance of the general departments of the city governments of the 250 cities for the fiscal period of 1929 amounted to $1,935,876,752, or $43.68 per capita. In 1928 the comparative per capita for operation and maintenance of general departments was $42.66, and in 1917, $19.07. Payments for the operation of public service enterprises, as water works, electric light plants, and similar enterprises, amounted to $166,657,371; interest on debt, $365,690,796; and outlays for permanent improvements, including those for public service enterprises, $967,065,008. The total payments in 1929, therefore, were $3,435,289,927; in 1928, $3,396,122,419; and in 1917, $1,108,021,565.

The per capita net governmental-cost payments for operation, maintenance, and interest for 146 cities covered by the various census reports since 1903 were $55.84 in 1929, $54.43 in 1928, $24.58 in 1917, and $16.41 in 1903.

The totals include all payments for the year, whether made from current revenues or from the proceeds of bond issues. Proceeds from the issuance of debt obligations are not considered revenue receipts.

Of the total municipal payments in 1929, 56.4 per cent was for operation and maintenance of general departments; 4.9 per cent, operation and maintenance of public service enterprises; 10.6 per cent, interest on debt; and 28.2 per cent outlays for permanent improvements.

The total revenue receipts of the 250 cities for 1929 were $3,075,234,308, or $69.39 per capita. This was $607,009,389 more than the total payments of the year exclusive of the payments for permanent improvements, but $360,055,619 less than the total payments including those for permanent improvements. The revenue receipts included $1,925,773,666 from general property taxes; $78,718,100 from special taxes; $100,003,577 from license taxes; $228,437,752 from special assessments; $176,227,226 from subventions, donations, and pension assessments; $148,725,430 from interest, rents, and highway privileges; $312,608,029 from earnings of public service enterprises; and $104,740,528, the remainder, from poll-taxes, fines, forfeits, and escheats, and earnings of general departments.

GOVERNMENTAL-COST PAYMENTS FOR OPERATION AND MAINTENANCE OF GENERAL DEPARTMENTS OF MUNICIPALITIES: 1929. (OTHER THAN FOR PUBLIC SERVICE ENTERPRISES)

	Group I Cities of 500,000 and over	Group II Cities of 300,000 to 500,000	Group III Cities of 100,000 to 300,000	Group IV Cities of 50,000 to 300,000	Group V Cities of 30,000 to 50,000
All general departments	$1,057,724,183	$211,916,848	$361,755,084	$213,044,878	$ 91,435,759
Per capita	51.70	48.81	34.58	34.11	32.52
General government	104,181,302	19,430,206	20,675,491	12,714,180	5,661,086
Per capita	5.09	4.48	1.98	2.04	2.01
Per cent of total	9.8	9.2	5.7	6.0	6.2
Protection to person and property	203,533,720	41,383,407	74,768,589	41,278,529	16,750,263
Per capita	9.95	9.53	7.15	6.61	5.96
Per cent of total	19.2	19.5	20.7	19.3	18.4
Conservation of health	25,766,033	7,186,270	8,812,418	4,357,384	1,957,171
Per capita	1.26	1.66	0.84	0.70	0.70
Per cent of total	2.4	3.4	2.4	2.0	2.1
Sanitation	87,403,643	13,378,486	23,806,199	14,760,611	5,076,498
Per capita	4.27	3.08	2.28	2.36	1.81
Per cent of total	8.3	6.3	6.6	6.9	5.6
Highways	89,348,669	19,500,462	31,801,652	18,358,429	9,466,079
Per capita	4.37	4.49	3.04	2.94	3.37
Per cent of total	8.4	9.2	8.8	8.6	10.3
Charities, hospitals, and corrections	78,406,531	18,658,070	14,250,028	7,929,407	4,006,868
Per capita	3.83	4.30	1.36	1.27	1.43
Per cent of total	7.4	8.8	3.9	3.7	4.4
Schools	350,417,470	72,126,959	155,908,322	97,203,447	40,858,850
Per capita	17.13	16.61	14.90	15.56	14.53
Per cent of total	33.1	34.0	43.1	45.6	44.7
Libraries	12,834,774	3,277,845	5,670,505	3,003,801	1,336,293
Per capita	0.63	0.76	0.54	0.48	0.48
Per cent of total	1.2	1.5	1.6	1.4	1.5
Recreation	38,903,261	7,299,362	13,095,931	6,875,299	2,870,109
Per capita	1.90	1.68	1.25	1.10	1.02
Per cent of total	3.7	3.4	3.6	3.2	3.1
Miscellaneous	66,928,780	9,675,781	12,965,849	6,563,791	3,452,542
Per capita	3.27	2.23	1.24	1.05	1.23
Per cent of total	6.3	4.6	3.6	3.1	3.8

ASSESSED VALUATIONS, PER CAPITA LEVIES, AND NET DEBTS: 1929

Per capita assessed valuation	$2,140.11	$1,842.87	$1,502.19	$1,486.70	$1,286.56
Per capita levy of general property tax for all purposes	63.53	56.89	49.15	49.54	43.58
Per capita levy of general property tax for government of city	61.36	51.65	37.95	37.73	34.30
Net debt at close of year	3,573,974,102	597,629,961	1,156,593,824	581,698,212	220,393,477
Per capita net debt	174.69	137.66	110.55	93.14	78.38
Estimated population*	20,458,600	4,341,400	10,462,000	6,245,200	2,811,700

* Estimates based on the increase between the census enumeration of Jan. 1, 1920, and the *preliminary* figures representing the enumeration of Apr. 1, 1930.

The preliminary statement of financial statistics for all cities for 1929 is now available from the Bureau of the Census, and the final report is in the hands of the printer.

American Municipal Association Elects Officers

THE American Municipal Association held its 8th annual meeting in Chicago on August 3-4-5. This group is a federation of some twenty-three State Leagues of Municipalities. Officers elected for the year 1931-1932 are:

President, Sedley H. Phinney, New Jersey
Vice-President, Frederick N. MacMillin, Wisconsin
Trustees, Morris B. Lambie, Minnesota; Morton L. Wallerstein, Virginia.
Harvey W. Draper of Texas continues as a member of the Executive Committee, being the immediate past president
Executive Secretary, A. D. McLarty, Illinois

Among the discussions were the following:

Activities of State Municipal Leagues, by John G. Stutz of Kansas
Services of a State League, by Sedley H. Phinney of New Jersey
Proposed Program of Work by the American Municipal Association, by Harold D. Smith of Michigan
Selling State Municipal League Advertising, by J. G. Stutz of Kansas
The Field of Leagues of Municipalities, by Dr. Charles E. Merriam, University of Chicago
State Control of Municipal Finances, by Wylie Kilpatrick, Assistant Secretary of the New Jersey League

Final arrangements were made for instituting a joint campaign for national advertising by the Association on behalf of the twenty municipal league magazines.

INFANTILE PARALYSIS

In order that all parents in New York City may receive helpful and authoritative information during the current epidemic of *poliomyelitis*, the City Health Commissioner, Dr. Shirley W. Wynne, has issued a pamphlet for free circulation to parents and others on preventing the spread of the disease. This little folder answers all such questions as: What is the disease? How is it spread? What should be done to avoid it? What ages are attacked? What are the early symptoms? What to do when a child is ill? And whether bathing at beaches and public swimming pools is safe.

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Extending the Season for Tennis

OAK PARK, ILL.—Since the construction of 24 concrete-paved public park courts, Oak Park citizens now may play tennis at least eight months out of each year. Formerly, they could play but five. There are several reasons why we chose to build with concrete. I believe that park superintendents and other municipal officials will be interested in these reasons and in our experiences with various types of construction.

Among the first courts we built were clay courts; others were constructed with a crushed limestone base and a topping of limestone screenings rolled into place. The original cost of a clay or limestone court was between $800 and $900. By building three at a time, however, we were able to reduce the total cost for three to approximately $2,000. These costs included installation of an adequate tile drainage system.

Owing to the changeable weather in the lower lake region, these courts, after a few seasons, were the cause of continuous complaints from the players. Very often after the courts had been rolled and sprinkled,—work which we were required to do daily,—some thoughtless person wearing hard- or high-heeled shoes would walk or play on the courts. Within a very few minutes the court was again ready for repairs. In addition to the daily expense of sprinkling and rolling, we used several tons of calcium chloride every year to keep down dust. All in all, the average yearly cost for maintenance and depreciation of each court was $500. This cost item and the daily complaints of dissatisfied players caused us seriously to consider a more permanent type of court construction.

As an experiment, in 1924, we built two concrete-paved courts. The bases for these were old limestone courts. A fill of fine cinders, 2 inches deep, was placed over the old playing surface. When this fill was well compacted through tamping and rolling, concrete was placed to a depth of 3 inches. A wearing surface one inch thick was then placed and troweled to a gritty, nonslip finish. A light-red pigment was floated in the surface of this topping concrete. In building later courts, however, we ordered the contractor to mix the mineral pigments with the concrete in the wearing surface. Expansion joints 1½ inches wide were placed along the tape lines and at the net line.

These two concrete courts proved to be satisfactory from both the playing and the maintenance standpoint and, as a result, we have since rebuilt others until 24 of the 27 courts in our parks are paved with concrete. An outstanding feature of each of these concrete courts is the use of color. After considerable experimenting, we chose a light shade of red because it is in pleasing contrast to the green surroundings of grass and shrubbery and because it provides a playing surface that does not reflect bright sunlight.

Tennis players in Oak Park are enthusiastic about our concrete courts, and we plan to rebuild the three remaining courts this year, using colored concrete pavement in each one. Heavy rains no longer make the tennis courts unfit for play; the concrete courts can be played on within a few minutes after the rain stops.

From the standpoint of the taxpayer, the construction of concrete courts in Oak Park represents a wise conservation of his money. The first cost of each concrete court was $1,100, or, when placed in a group of three, approximately $1,000, exclusive of drainage which was installed when the clay or limestone courts were built. The only item of maintenance to date has been the painting of tape lines each spring. The cost of this is practically negligible. Through the elimination of a $500 maintenance expenditure each year, one of our concrete courts essentially pays for itself in 2½ years.

It is interesting to note that our present courts are used the year around. During the cold winter months we flood the courts for use by ice skating enthusiasts. Being properly constructed of well-made concrete with adequate fill and expansion joints, the courts form a first-class base for the ice.

During the mild weather in January and February of this year, hundreds of tennis players used our courts almost every day. Between February 20 and March 4, the courts were in constant use from sun-up until darkness prevented play.

GUSTAF A. LINDBERG,
Secretary and Superintendent, Park District.

ONE GROUP OF THE OAK PARK COURTS

"Phony" Auctions Prohibited

SAN FRANCISCO, CALIF.—One of the most recent examples of cooperation between business men and different municipal departments for the benefit of the general public is our newly amended ordinance for the regulation of auction sales of merchandise. The intent of this new legislation is to promote legitimate business methods and prevent fraudulent practices in goods selling. It was drafted by the Down Town Association, approved by the Police Commission, and submitted by the latter body to the Board of Supervisors. The Mayor's signature was appended on August 1.

Its effective administration means that the people of San Francisco can be sure that when a "closing-out" sale is announced, it has been conceived and is conducted honestly, inasmuch as all conditions surrounding it will have been carefully examined by the Police Commission before a permit is issued. The Commission designates the period of the sale not to exceed 30 days, and no merchandise or other personal property can be offered or sold unless it has been on the premises not less than 90 days prior to the filing of application for a permit. An inventory of the goods to be sold must be filed, and the owner or his creditors must make oath that the sale shall be confined to such goods and that it is

intended to be a bona fide closing-out of business from which the applicant will retire.

The ordinance as it now stands does not apply to any closing-out auction sale of merchandise where the owners or their creditors are engaged in a legitimate closing-out, or when such sale is on premises where such business has been carried on for over a year.

A. R. FENNIMORE,
Secretary, Down Town Association.

Milwaukee County Has Its Own Roadhouse

MILWAUKEE, WIS.—Determined to find a way to do its part in providing clean, wholesome entertainment for its citizens, Milwaukee County has erected a $52,000 clubhouse at Brown Deer Park and is conducting dances and offering people of this territory an out-of-town place to dance and have fun. Built in 1930 as an experiment, the clubhouse, known as the "Milwaukee" roadhouse, has been a decided success.

The dances so far have been attended by young folks who ordinarily go to private roadhouses, and they behave well. Then, too, middle-aged people who say they never go to private roadhouses come regularly to the Brown Deer clubhouse to enjoy the supervised dances. They like the roominess and the refined atmosphere. Many people who never visited the park before are coming out on hot days to listen to the music, chat with golfers and sip cold drinks in the spacious clubhouse, according to Jerome Dretzka, Secretary of the Park Commission. From the attendance this spring, he says, it is clearly evident that many refined people of middle age like to dance in a supervised roadhouse such as the county operates.

Plans are already under way to establish similar clubhouses in all Milwaukee public parks financed and supervised by the county. Mr. Dretzka is of the opinion that the time will come when all large cities will make some effort to supervise such high-class entertainment for its citizens. Under the present plan of operating the clubhouse, groups may charter it, provided the county supervises the functions.

A. P. NELSON.

A Cemetery That Isn't a Labyrinth

TACOMA, WASH.—The writer has had occasion recently to prepare studies for a new cemetery tract of 100 acres, a half-mile in length and 1,650 feet wide. The topography being quite uniform, the opportunity was presented of making a symmetrical plan, endeavoring to avoid the usual aimless wandering about the face of nature, where trying to fit a design to inconvenient terrain.

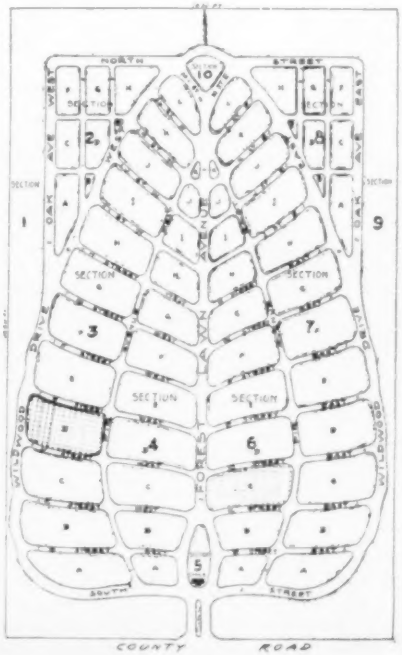
The accompanying sketch was evolved, believed to be especially well suited to demands of traffic, simplicity of burial record, and also ease of supervision. The shock from realizing that a conventional design has been used for a cemetery layout may be overcoming, but there is the reviving sense of an escape from the labyrinth that ordinarily characterizes cemetery plats for no reason at all. Let such a one visualize a trip to his lot, block and section, following the usual tortuous way to his object, and then threading his way out, suddenly finding himself in the far northeast corner of nowhere, a long way from the entrance. The frequency of such experiences lays a stress on the usefulness of the proposed design.

L. A. NICHOLSON,
City Engineer, Ruston, Wash.; member of the firm of L. A. Nicholson & Sons, Civil Engineers.

THE ROADHOUSE AT BROWN DEER PARK

Attracting the State to the Capital

HARRISBURG, PA.—In the span of a month and a half, 6,000 school pupils, organized in 176 groups, visited the State Capital City in Harrisburg. They came because they had been convinced of the value of an organized trip, because the possibilities of what could be seen at low cost had been pictured graphically by the Harrisburg Chamber of Commerce. For some years, secondary school groups throughout the state have been taking sporadic commencement period trips. A few of these included the State Capital City. The plan conceived by the Convention and Visitors' Bureau of the Harrisburg Chamber of Commerce made the Capital community the mecca. The Chamber's sales method began last spring with 1,043 secondary schools. Printed invitations were mailed to the principals of these institutions, then an explanatory illustrated folder went to the presidents of the senior classes. Simultaneously, descriptive stories were mailed to 276 newspapers. Rail and bus companies were urged to solicit the transportation business. Folders set forth specifically the cost of one, two or three days in the Capital City, explained the services which the Chamber renders, and told exactly what could be done, and what could be seen.



PLAN FOR A NEW CEMETERY

When a school announced that it would take the trip, a definite plan was prepared for it. A special story was written for the local newspapers circulating in that territory, telling when the pupils would come and what they would see. Such newspaper articles had value in many directions. They stimulated the interest of the pupils, and also told thousands of other people the historic and fascinating things and places to be seen in Harrisburg.

The Chamber's Visitors' Bureau notified hotels, restaurants and theaters of school visits, requesting that the managers of these establishments send another message to the person indicated. Many of these wrote warm invitations to the pupils to visit them; in the case of hotels, to make their home in that hostelry. There was therefore an avalanche of communications from various places in the city following up the Chamber's original suggestion.

When a group came to town, if it desired, it had a staff member of the Chamber as guide. Side trips and visits to newspapers and industrial plants were

TRAVERSE CITY'S FRONT YARD

Where for ten years there was only a litter-ridden and weed-grown stretch of waste-land are now a fine aquarium and a zoo

Where municipal spending ability could not meet the pressing requirements for improvement, citizen effort intervened. Traverse City, in working to create one of the finest waterfront parks of the region, is making a demonstration of civic efficiency

arranged. Under such auspices, these groups saw many things that ordinarily they would have missed. Naturally, the State Department of Public Instruction was interested, aided in encouraging visits, and brought many teachers and principals into the State Department.

Now 6,000 school pupils know more about Harrisburg, are enthusiastic at the reception they received, and are telling their relatives and friends of Harrisburg's hospitality and courtesy.

This is but one phase of an enlarged activity on the part of the Convention and Visitors' Bureau. It emphasizes service. It seeks the return visitor. Chamber members, subscribing to an Expansion Fund, made possible these broadened activities as well as a Business Extension Bureau wherein an industrial committee directs the operations of a secretary whose main job is to aid established industries and advertise Harrisburg.

Harrisburg has gone into the field of convention reception with a record of an unusual number of such meetings held in the past few years. The city has new hotels, and a number of others remodeled, and its Chamber of Commerce maintains a Housing Bureau which functions during conventions to provide accommodations for those guests who either are unable to get into hotels or prefer private homes. A mammoth Farm Products Show Building with 440,000 square feet on one floor, erected by the state, is but one of its many excellent meeting places. The state has also completed its Educational Building, including an auditorium said to be one of the most beautiful in the world, seating 2,500 people. In June alone, 4,609 people attended 37 conventions, business conferences, and other small meetings. This is fairly typical. Motor tours have been rerouted via Harrisburg because the Chamber has proved that the route is shorter and the journey more interesting.

The Convention and Vistors' Bureau is getting business for the community. Its Chairman, Roy W. Shreiner, says, "Every dollar spent here goes into circulation and everybody must gain. It's a business proposition."

DANIEL N. CASEY,
Secretary, Chamber of Commerce.

"We Fix Up Our City's Front Yard"

TRAVERSE CITY, MICH.—When the voting public refused to sanction a bond issue to finance improvement of a bay-side park, the public-spirited business and professional men of Traverse City voluntarily subscribed to a fund which has not only started the beautifying of the waterfront but has built the largest aquarium and zoo in the Middle West devoted exclusively to native animals, birds and fishes.

Traverse City lies in the summer resort region of northern Michigan at the head of beautiful and historic Grand Traverse Bay, whose blue waters have for many years attracted thousands of visitors annually. It originally was a lumber town, which means that its waterfront was monopolized during the early years of its history by sawmills. When the timber was depleted, the mills departed, leaving a long stretch of shore land covered with débris. This the city purchased.

But then, the public, for some reason known only to those who vote "no" upon such occasions, refused to sanction a bond issue for a modest sum to improve the park tract. For a decade it lay idle, gathering more débris and growing to weeds. There seemed little hope of doing much from budgetary allotments.

Conrad H. Foster, a retired circus man, had been acquiring animals as pets until the family garage would no longer accommodate them. The aquarium in his garden was too small for many fish. So he did some figuring with an architect and started forth with paper and pencil and an enthusiastic gleam in his eye. When he came back he had enough funds pledged to build an attractive aquarium, which was promptly stocked with bass, trout, and all the smaller pan fish, as well as specimens from the Great Lakes commercial fishing nets.

This year the zoo was built. Mayors and officials representing a score of Middle Western cities helped dedicate it. The Michigan Conservation Department aided in stocking it.

One of the finest features of the project is the fact that the bay-front park has been partly developed and turned into a place of beauty comparable with the grand vista offered by the sapphire waters of Grand Traverse Bay. Rock gardens, green lawns, shrubbery, and flowers have replaced rubbish heaps. Civic groups have volunteered to beautify other units of the park, and the idea has spread to other city property, where neighborhood groups are cooperating in beautification.

Instead of asking, "Why doesn't the city do something with its parks?", the people now say, "We think we are doing a good job with our community front yards."

B. L. TAYLOR,
Secretary, Chamber of Commerce.

Ridding Local Movies of Gangster Films

THE ORANGES AND MAPLEWOOD, N. J.—Gangster films swept the Oranges and Maplewood as they have every other community. There was a regular cycle of these pictures. The sale of toy pistols

went up, and the chief sport of many gangs of youngsters was imitation of the feuds between the big gangs and between the gangs and the police. Being policemen, however, was not so popular. The youngsters liked best to play the parts of the "big shots." These games were eternally to the fore, not only in the poorer districts but in the finest residential sections.

The thinking people of the community finally became really alarmed at the trend of their youngsters' thoughts. It became evident that gangster films were far more potent in influencing young minds than were the Jesse James novels of an earlier generation. Mayor Charles H. Martens, of East Orange, aptly attributed this to the fact that the locale was not thousands of miles away in a West that one could only dream of, but was right at their very doorstep. Every neighborhood might have its gunmen, and thrill to their wild adventures.

The comparatively young Women's Division of the Chamber of Commerce and Civics of the community had organized a Better Films Committee, the purpose of which was to attempt, through cooperation, to bring about a better understanding, on the part of all concerned, of the problems offered by the pictures. This was of course the logical group to head the fight that finally was waged to get rid of gangster pictures.

Oddly enough, it was a theater manager who brought up the subject of gangster films. He told the women at one of their early meetings last spring that if the Committee wanted to confer a favor on the managers, it would use its efforts to get rid of underworld pictures. He didn't want them in his theater, he said, and he didn't believe others did, but the block-booking system made it difficult for them to escape accepting them, while competition still further complicated matters.

The women took this as their cue and began a crusade that quickly attracted attention.

Mayor Simeon H. Rollinson, of West Orange, took matters in his own hands and ended gangster films in his town by giving the managers orders to remove all gangster pictures from their programs.

The Better Films Committee of the Chamber instantly followed this by contacting all the mayors, including Mayor Rollinson, urging them to join hands in a common request to theater managers to discontinue the showing of the unwanted pictures. Mayor Martens had been an enemy of the gangster pictures, and he took hold of the matter and drew a petition signed by himself which he urged the other mayors to sign, and they did so.

There was something of a furore when this request went out, but the managers, with one or two exceptions, apparently welcomed the courteously worded round robin and promptly informed their organizations—for most of the theaters are connected with chains—that gangster pictures were banned.

Just at this time the terrible accident happened in Montclair, an adjoining community, in which a lad killed his chum while enacting a scene in one of the more notorious of the underworld pictures. This tragedy gave point to the effort being made in the Oranges, and the women continued their efforts with vigor.

Two of the theaters apparently did not take the request of the mayors or the fight of the women seriously. Mayor Frank J. Murray, of Orange, made short shrift of both cases. The managers were told that if they did not eliminate films of the banned type, he would refuse to renew their licenses when they expired.

Apparently that served the purpose, but in two or three weeks one of the managers advertised "The Good Bad Girl." This is a film that most pre-viewers condemned as among the bad underworld pictures. Mayor Murray got on the job the minute the women made known to him the character of this picture, and it was withdrawn at considerable expense. The manager pleaded that he did not know the nature of the picture; that advance sheets had not been sent to him. The women got out a letter to all the managers telling them of the nature of "The Good Bad Girl," but even that did not serve to keep the picture out of the town, and it was shown at a Maplewood theater. That matter is being handled now in a manner that it is hoped will bring about closer cooperation on the part of all concerned.

While the battle is not yet over, it is a fact that gangster pictures have been all but barred from the community and have ceased to be an influence of any importance as far as the local theaters are concerned. The effort has been a worth-while one and is being continued, still on the basis of friendly cooperation, where it is possible, but with a firmness that is leaving no doubt in any one's mind as to the intention of the women.

It might be added that one of the most significant meetings held during the past winter was that at which Carl E. Milliken, Secretary of the Motion Picture Producers and Distributors Association, was the speaker. As a result of that conference, attended by representatives from about thirty local organizations of men and women, a petition was drawn up and sent to Mr. Milliken listing the abuses charged against the pictures, including the block-booking system.

Subsequently another official attempted to defend gangster pictures on the ground that they met the requirements of psychologists and psychoanalysts and always found the gangster in the toils of the law before the final fade-out. This drew fire from Mayor Martens, and the quotations gained publicity far and near.

It is the opinion of the Chamber that few of its efforts to make the community a better place in which to live and do business have been crowned with greater success than has this sharp and intensive fight to rid the local movies of gangster films.

A. EDMUND WILLIAMSON,
Executive Secretary, Chamber of Commerce and Civics.

THE SYDNEY HARBOR BRIDGE

Sydney's great arched harbor bridge, just completed under direction of the Department of Public Works of New South Wales, provides uninterrupted communication between the city and its northern suburbs for railway, vehicular and pedestrian travelers. The clearance for shipping is 170 feet at high water, which is 35 feet greater than the headway of Brooklyn Bridge and 20 feet more than of Canada's great Quebec Bridge. The roadway is 57 feet wide between curbs, and is flanked by two lines of railway on each side, with a footway on the outer side of each double track.

The total length of the steel work is 3,770 feet and there are five steel approach spans at each side of the Harbor. The contractors, Dorman, Long and Co., undertook the construction work in accordance with official plans and specifications as prepared by Dr. J. J. C. Bradfield, Chief Engineer, at a cost of £4,217,721.

Grand Rapids Uses Scrip to Pay Temporary Unemployed Workers

GRAND RAPIDS, MICH.—A method of payment known as the "scrip system" has been worked out and used successfully in Grand Rapids to remunerate unemployed workers for whom the city has provided temporary jobs. The system, under which the city receives 82 cents in labor for every relief dollar expended, assures taxpayers that the recipients of the money will not spend it for luxuries.

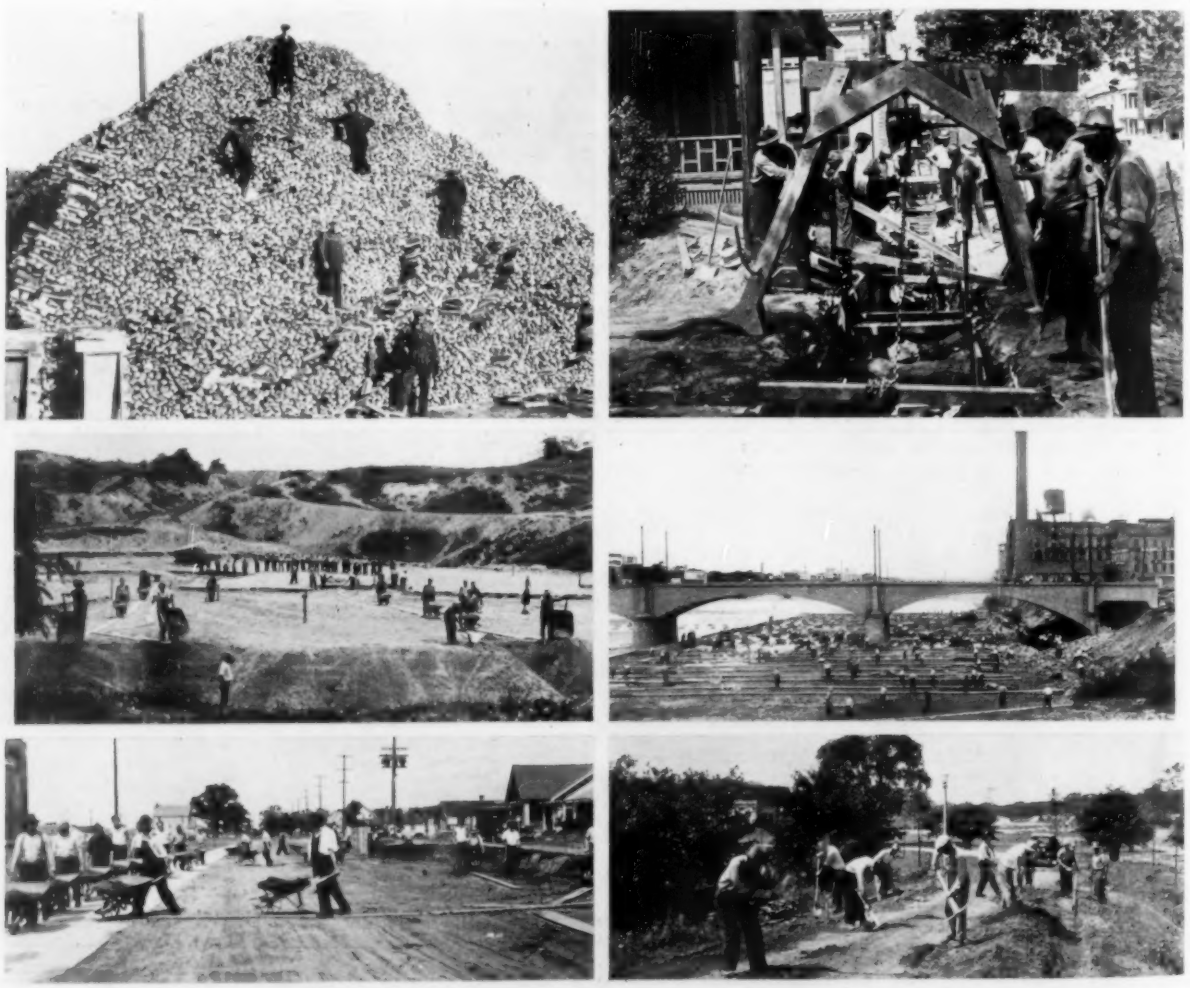
More than 2,000 jobless men are receiving the equivalent of $10,000 weekly in food, fuel and clothing in proportion to their needs and those of their families, in return for work on park and other public works projects carried on by the city. The men are paid in scrip at the rate of 40 cents an hour, and are employed for the number of hours necessary to enable them to meet their needs. The scrip come in denominations of 20 cents and one dollar, and is redeemable only at the city store, where it will purchase groceries, fuel and other necessities. Special tickets are issued for bread and milk; these may be presented only at bakeries and dairies.

All applications for assistance are investigated by the social service department, which determines the amount of relief needed. Then the applicant is given a physical examination and assigned to the employment office for the type of work for which he is fitted. If his family is in distress, it is given aid immediately.

Relief expenditures are financed by emergency bond issues; for the fiscal year ending May 31, 1931, there was an issue of $150,000; for the current year two issues have been sold for a total of $500,000. Of the total of $50,217 for material relief in June, the sum of $41,067 was earned by labor and paid for by scrip. Welfare labor has been used to start the development of a park north of the city, where playing fields and a natural stadium are being created. An old brick building on the site of a new convention hall has been demolished. A trail has been cut along the Grand River, and a large area of exposed river bottom has been cleared up. Scrip labor is also used for street widening and the laying of water and sewer mains.

The outstanding reason for the use of the scrip method of reimbursement is the fact that its use prevents the diversion of relief for pecuniary gain, and we are assured that material aid goes only where it is needed to prevent suffering. To protect this plan and to secure it against possible fraud, it has been found necessary to set up a city store to dispense merchandise, and this angle of the system is supervised by our Welfare Department as a part of the whole program of material relief. The merchandise sold from the municipal store is bought by the city's purchasing agent at wholesale prices from leading merchants of the community. Although this merchandise is exchanged for scrip at retail prices, it cannot be truthfully said that the city is profiteering thereby. Grand Rapids is only making its welfare funds go further than if the food was bought at retail and distributed on a retail price basis.

GEORGE W. WELSH,
City Manager.



SCRIP-PAID LABORERS AT WORK IN GRAND RAPIDS

The views (from top to bottom) show wood cleared from a 60-acre tract, cut, and being stored in the City Wood Yard for Welfare Department distribution; a steep hill being leveled for a park addition; grading on an unimproved street; the laying of a mile and a half of water pipe; the river-bed being cleaned at low-water; and preparation for concrete paving work at the city sewage plant

TRAFFIC CONTROL AND FACILITATION

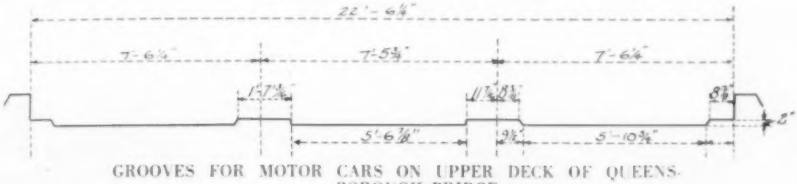
Conducted by the Institute of Traffic Engineers, 175 Fifth Avenue, New York

Publications Committee: Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straets

Tracks for Automobiles

IN an attempt to utilize most effectively the new upper vehicle level of New York's Queensborough Bridge, (built at a total cost of approximately $5,000,000 including property acquired), tracks or grooves have been built to carry three lanes of automobiles in one direction on a pavement only 22 feet 6¼ inches wide. The roadway was opened to traffic on June 25, 1931.

Details of the design are shown in the accompanying cross-section. The entire roadway is of steel with the exception of the wearing surfaces and the edges of the grooves, which are of sanded and creosoted wood blocks. As originally



GROOVES FOR MOTOR CARS ON UPPER DECK OF QUEENSBOROUGH BRIDGE

constructed, the edges of all grooves were vertical. Motorists, however, complained that the sharp edges cut and "burned" their tires. In addition, the low clearance between vehicles moving opposite each other was claimed to be unsatisfactory to the drivers. A "storm of protest" arose and it was said that motorists were "boycotting" the new roadway.

As a result several changes were introduced: The center lane was closed to all traffic, the vertical edges of the grooves in the outer roadways were chamfered at an angle of 30 degrees as shown in the cut, and the permissible speed reduced from 30 to 15 miles per hour.

Even with these changes, motorists were reported to declare the roadway unsatisfactory and unsafe. As a result, the Department of Plant and Structures, which designed the pavement, is contemplating still further changes. The first will be to pave the center lane, eliminating the grooves, and if this is unsatisfactory, to pave also the two outer grooves. When this has been done, only two, instead of three, lanes will be available for traffic.

It is indeed unfortunate that this experiment is to be abandoned so soon after its inauguration. Several trips across the bridge in the grooved roadway indicated that the average driver experiences no difficulty of the type complained of. The objections, undoubtedly, have come from that small minority which is always voluble whenever an innovation is attempted which seems to interfere with their personal liberty. For so long motorists have been accustomed to use the entire roadway, both while moving and standing, with little consideration of the public, that any change which restricts this freedom becomes "an abhorrence unto their ego."

The design of the grooves, perhaps, might be improved, and no doubt adequate tests would develop a "track" satisfactory to all. If this were accomplished, three lanes could be operated with safety, furnishing the equivalent of a new roadway worth at least $2,000,000 to the city. Certainly the cost of the required research would be little in comparison to the high possible return.

The temporary abandonment of this plan should not discourage others from studying similar projects intended to increase street and highway efficiencies. The possibilities of adding to the utility of a street by confining vehicles rather rigidly to fixed directions are far-reaching. It has been proved already in many instances that streets with painted lanes handle traffic more satisfactorily than where anyone is allowed to drive on any portion of the pavement which he, at the instant, may prefer. There is no reason why actual physical separation of adjacent lanes should not prove even more advantageous.

The Queensborough Bridge is the most heavily traveled bridge in the New York metropolitan area. The original vehicle level consists of six lanes. The maximum traffic during a one-hour period was recorded in 1929 when 6,578 vehicles crossed: 4,445 east bound and 2,133 west bound. The estimated total daily traffic is about 80,000 vehicles. It was believed that the capacity of the bridge would be increased at least 50 per cent with the opening of the new roadway.

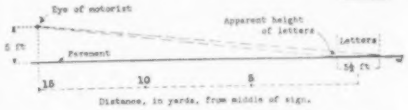
Parking Restrictions Increase Patronage of Stores in Los Angeles

THE Annual Report of the President of the Los Angeles Traffic Association, 1930, has the following to say about parking restrictions in the business district:

"Los Angeles has proved, through incontestable figures, that prohibition of parking, or severe restriction of parking, has no adverse effect on the number of automobiles coming into its central business district. On the contrary, it is definitely shown that proper restrictions encouraging the free movement of traffic greatly increase the number of cars that carry patrons to mercantile establishments within this business area. These conclusions are based on a series of surveys made by the Los Angeles Traffic Association at intervals since 1924. Of late years, there has been no attempt to prohibit parking completely in the Central Business District of Los Angeles. Instead, legislators have been content to gradually increase the restrictions as they were needed to remedy conditions. At the present time all parking is prohibited between 4:30 and 6:00 P.M. during the peak rush hours. Also all parking of individual cars in the central business district is restricted to 45 minutes during the day. Besides this, more than half of all available curb area has other restrictions, ranging from entire prohibition to 20-minute parking for loading vehicles."

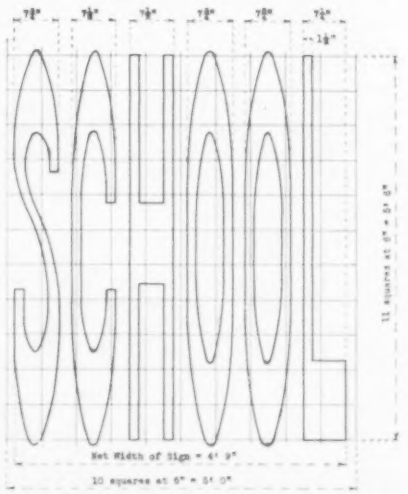
Elongated Pavement Letters Designed by Eno Foundation

THERE are many places where lettering and symbols can be placed upon the pavement with good effect. It is perfectly obvious that the ordinary letter is not adapted to this use. At distances of six or eight yards they are so foreshortened as to be illegible. But by stringing them out so that the height is eight or ten times the width they may be read from such distance as to give the driver ample time to act on the warning. This is made clear by the diagram herewith.



If the letters are 5½ feet high and 7 inches wide, they will appear approximately square at a distance of 15 yards, and may be read easily at a much greater distance.

Elongated letters and signs have been



PAVEMENT WARNING SIGN
Designed by Eno Foundation for Highway Traffic Regulation

designed especially for this purpose. They have been tested by actual use and the dimensions are such as to give the best results for distances from 20 to 40 yards. This, in general, gives time enough, and a motorist with normal eyesight can read them still further away. A speed of 30 miles per hour is about 15 yards per second.

The diagram shows suggested dimensions of a "School" design for pavement use. The Eno Foundation for Highway Traffic Regulation, Inc., Saugatuck, Conn., has issued a brief report containing designs for various types of warning signs, this being one of them.

Lax Enforcement of Traffic Rules a Prevalent Cause of Congestion

ILLUSTRATED by pictures from 11 cities in the United States and Canada, all showing flagrant violations of posted parking regulations, an interesting story has been written by John A. Milder, Jr., Editor, *Electrical Railway Journal*, on the observance of parking rules, which is well worth reading. The following excerpts from *Electric Railway Journal*, August, 1931, pp. 400-404, are particularly to the point:

"The automobile owner who creates congestion by failure to observe parking restrictions unconsciously pays his share of the enormous cost of congestion, estimated at nearly $100 per family per year. The costs of congestion are so hidden, however, that it is difficult to convince the average man that he is really paying them. The shipper of merchandise, whose vehicles are delayed, passes on to the ultimate consumer as much as possible of the cost of traffic congestion. Congestion also adds to the costs of municipal government, borne by the tax payers and rent payers. But in both cases the part which is attributable to traffic congestion is so intermingled with other costs as to be unrecognizable.

"Two possible ways of improving the situation are: To secure greater voluntary observance of the rules; or to devise more effective methods of enforcement. It appears unlikely that the problem can ever be solved entirely by encouraging voluntary observance of traffic regulations. A certain number of individuals would always place their own immediate convenience above the general welfare and the action of these few violators would go a long way to offset the benefit resulting from better observance by the majority.

"At present there are two principal obstacles in the way of effective enforcement. The first is the difficulty in serving a summons on a violator. The second is 'ticket killing.' Most of the trouble arises after the summons has been served. Almost every one has a friend who has a friend who knows somebody influential in the municipal government who can arrange to have a ticket killed. Probably no one dislikes this practice more than the police themselves, for it goes a long way to nullify their work. But the practice is too well established to expect that the police themselves should put an end to it.

"A practical solution of the system appears to be the triplicate tag system, now in effect in a number of cities. Under this plan one copy of the summons goes to the driver of the offending vehicle, a second to the traffic bureau and a third to the judge of the municipal court. With this arrangement in effect the driver must do his wire pulling in both the police department and the court. Thus the difficulties in the way of getting a summons cancelled are greatly increased."

Non Uniform Signals for Color-Blind Drivers

A NEW lens design has been suggested for the benefit of color-blind motorists, which uses not only color but shape to distinguish the different indications. While the design is ingenious, as shown in the illustration, most traffic

COLOR-DESIGN SIGNAL

engineers have been opposed to superimposing shape upon color, since much of the efficiency of the signal is destroyed.

The inventor of the light estimates that one per cent of the men and one-tenth of one per cent of the women are color blind. However, there are many different degrees of the affliction, and the standard recommendation for the location of colors, i.e. red at the top, yellow in the middle, and green at the bottom, appears to be progressively eliminating this difficulty. The present tightening up of drivers' examinations should do much to restrict the small per cent afflicted to a dangerous point, as well as to instruct them as to standard locations.

Motor Vehicle Inspection Shows Faulty Equipment

OAKLAND, CALIF., has conducted a Safety Lane for one week in which over four-fifths of the cars were found to have faulty equipment. As is well known, these inspections, besides correcting equipment, have a valuable moral effect by making people conscious that an automobile must be maintained in good condition if it is to be operated safely.

During the month of the campaign and the month following it, eight fatalities occurred. This was six less than during the same period in the previous year.

The table shows the number of cars tested and the types of faulty equipment discovered:

RESULT OF EAST BAY SAFETY COUNCIL'S SAFETY LANE, OAKLAND, CALIF., JUNE 8-JUNE 13, INCLUSIVE

	Number	*Percent*
Total cars tested	6,512	100
Cars found O.K.	1,107	17
Cars found defective	5,405	83

Parts Found Defective	*Number of Defects*	*Percent of Defects*
Brakes	3,699	23
Headlights	4,640	30
Parking lights	410	3
Tail-lights	657	4
Stop lights	2,033	13
Wheel alignment	2,654	17
Horn	232	2
Windshield wiper	630	4
Rear view mirror	255	2
Steering wheel	334	2
Total	15,544	100

An Experiment with Traffic Control Signals in London

ONE of the heaviest traffic streets of London, and one of the most congested, is Oxford Street. A short time ago the Minister of Transport decided to install traffic control signals on this street to expedite traffic and relieve congestion.

In order to make the installation effective, the Minister issued an order the purpose of which was to eliminate in advance such obstacles as might make the application of traffic control signals a failure.

Parking is prohibited throughout Oxford Street from 12 noon to 7 P.M. on weekdays and from noon to 3 P.M. on Saturdays. During these hours stoppage of cars has been limited to the handling of passengers by private cars or taxis, to loading and unloading for not more than 10 minutes, and to emergency vehicles.

Slow-moving vehicles are prohibited from using the street and may cross only at certain crossings.

U-turns are eliminated, except in the case of taxis about to pick up a fare.

Some side streets are made one-way streets.

Right-hand turns (our left turns) into and from Oxford Street are prohibited at many intersections.

Direct crossings of Oxford Street are eliminated at certain intersections.

To the traffic engineer this type of planning should be a lesson. The Minister of Transport apparently plans to make traffic control signals on Oxford Street a success and has embarked upon this venture in thorough and businesslike manner.

Human Nature vs. the Motor Vehicle

HUMAN nature has not adjusted itself to take full advantage of the modern perfected automobile, nor has it been able to keep pace with the problems arising from this means of transportation and the dangers resulting from the operation of this vehicle on our streets. "Not only in *number,* but in percentage, these defects in humanity run so far ahead of the defects in the automobile as to make it instantaneously obvious that we have only ourselves to blame," states Dr. Miller McClintock, Director of the Albert Erskine Russel Bureau for Street Traffic Research, in Harvard University.

The report shows that only one in every ten accidents can properly be attributed to the automobile, which leaves the glaring fact that 90 per cent, and over, are the result of bad judgment, human carelessness, or human stupidity. Industrial safety studies have shown a surprisingly similar parallel in that only 15 per cent of all industrial accidents may be prevented by mechanical guarding of machines, or that 85 per cent involve human action, neglect, inattention or error. In both instances these facts point to the apparent remedy-education. Study of over a million accidents reveals that only 11 per cent of the accidents are attributable to defective brakes, lack of chains, improper or no headlights, and other defects such as that of steering wheels.

The overwhelming proportion of accidents take place on dry roads, on good road surfaces, in clear weather and in daylight. Dr. McClintock's studies bear that out, showing 80 per cent of the mishaps on good road surface, 81 on fair days and 57 per cent in daylight. One-fourth of the difficulties result in crossing between intersections. Other causes are children playing on streets, 20 per cent; no signals at intersections, 12 per cent; coming from behind parked cars, 11 per cent; crossing intersections against signals, 11 per cent; and crossing at intersections with signals, 8 per cent.

Eighteen Per Cent Obedience to "Stop" Signs

THE New Jersey Traffic Commission's "Stop" sign survey, which indicated that there were 12 or 13 thousand intersections covered, has been amplified by a study of the obedience of some 81,000 motorists entering these intersections. It was found that only 18 per cent obeyed the signs, and of these nearly half had to stop because of traffic conditions.

In order to insure the removal of unnecessary and obedience-destroying "Stop" signs, the Commission has secured an amendment to the Traffic Act, giving it full control over all Stop signs, local regulations affecting them, their location, and the selection of through routes.

It is anticipated that the Commission's action will do much to increase the effectiveness of "Stop" signs by cutting down their "over-use."

Baltimore to Eliminate Amber-Red Sequence

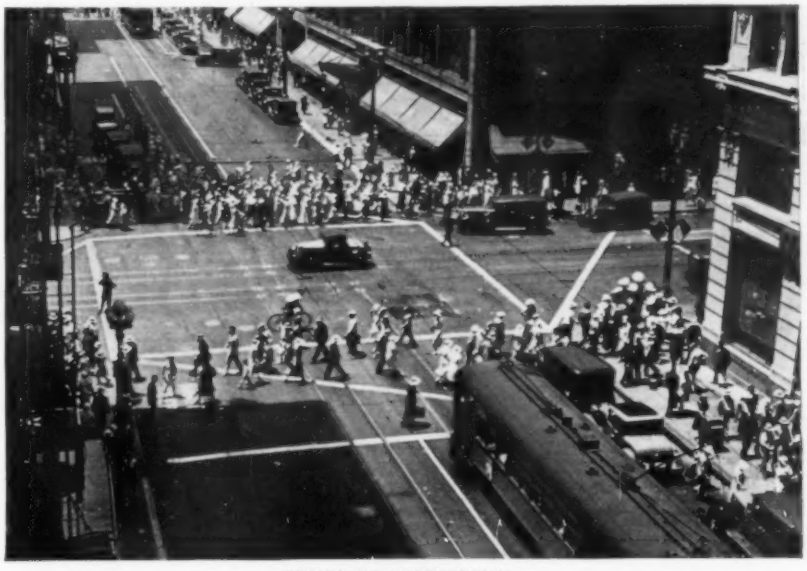
ONCE again the question as to whether the yellow signal should be shown following the red comes up for discussion. According to Police Commissioner Charles D. Gaither, of Baltimore, there has been a strong tendency for motorists to start on the yellow instead of waiting for the green, particularly in residential areas when no officers are present. At locations where the red-yellow combination has been eliminated obedience has been much better. Accordingly the Commissioner plans to change over to the signals in the entire city so that yellow will be shown only following the green.

The yellow signal following the red was primarily used to give waiting motorists an opportunity to get their cars in gear and prepare to start. In many places where it has been removed, "wise" motorists have merely looked at the signal on the other street and used the yellow following the green as a signal to "jump the gun." It would appear that the problem is as much one of training the driver as it is of the color sequence used in the signal.

Heavy Traffic in Los Angeles

R. T. DORSEY, Traffic Engineer of Los Angeles, has completed an interesting volume study of heavy traffic intersections in Los Angeles. One of these, the intersection of Seventh Street and Broadway, is shown in the cut. Each street has a roadway width of 56 feet. During a twelve-hour count, from 6 A.M. to 6 P.M. on July 2, 1931, 183,717 pedestrians, 24,147 automobiles, and 2,610 surface street cars entered the intersection.

Special attention is called in the photograph to the excellent pedestrian obedience of traffic signals. Without exception pedestrians are moving only on the green. The prominent pavement markings undoubtedly assist greatly in directing and ordering both the vehicle and pedestrian traffic.



EDUCATED PEDESTRIANS

This is a view of Seventh Street at Broadway, Los Angeles, taken at 12:30 P.M. on a week-day

RECENT CITY MANAGER APPOINTMENTS

W. E. BAUMGARDNER, city manager of Grand Haven, Mich., since 1928, was appointed city manager of Logan, W. Va., on August 4, to succeed W. M. Healy. This is Mr. Baumgardner's fifth city as he had served previously as manager of Albion, Alpena, and Bay City, Mich.

Knowland Brode became city manager of Newton, Kansas, on July 1. At the time of his appointment he was city engineer of Newton. He succeeds A. G. Lindgren, who resigned.

R. E. Butler succeeded George R. Wade as city manager of Tucson, Ariz., on July 1. Mr. Butler had been a member of the Tucson Civil Service Commission for a number of years.

Merle Conrad, a merchant in Hollywood, Fla., was appointed city manager of that city on August 6, to succeed Charles W. Ten Eick, who had been city manager for one year.

E. V. Spence was appointed city manager of Big Spring, Texas, on August 1, to succeed V. R. Smitham, who became city manager of Wichita Falls. Mr. Spence was city manager of San Angelo, Texas, from July, 1925, to January, 1929.

Nicholas F. Yonkman became city manager of Grand Haven, Mich., on September 1. He succeeds W. E. Baumgardner, who resigned to become city manager of Logan, W. Va. At the time of his appointment Mr. Yonkman was a member of the city council, from which he resigned to become city manager.

CLARENCE E. RIDLEY,
Executive Secretary, The International City Managers' Association.

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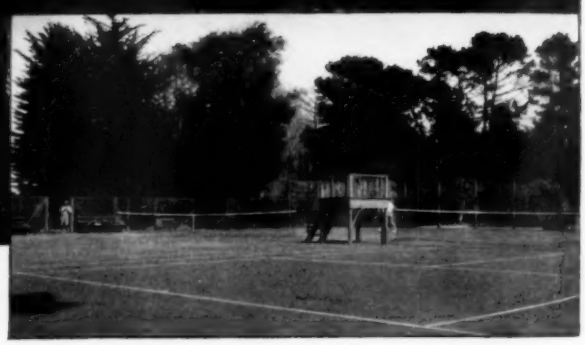

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Prepared by
FRANK B. WILLIAMS
Author of "The Law of
City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected
by the Zoning Committee
of New York
(233 Broadway)

Private Covenants—Buildings

MARYLAND.—*Himmel v. Hendler*, 155 A. 316.—Covenants in a deed not to build on strips of adjoining land prohibit only structures materially obstructing light, air or view. The erection of a fence inclosing the rear portion of such a strip of land in a laundry service yard is therefore not a violation of a covenant not to build thereon. A fence is not a building in the common acceptation of this word, although fences are commonly spoken of as being built.

Zoning—Consents

MINNESOTA.—*State ex rel. Eha v. Bundlie and others*, District Court, Second Judicial District, July 23, 1931.—The state enabling act (Gen. Stats., 1923, Sec. 1614) authorizing the city of St. Paul and the other first class cities of the state to adopt zoning regulations requires that amendments altering such regulations shall be made only after the filing of the written consents of the owners of two-thirds of the several descriptions of real estate situate within 100 feet of the real estate affected, and the affirmative vote of a majority of the members of the governing body of such city. *Held*, that such consents may lawfully be required as a prerequisite to the vote of the city council.

NOTE BY EDITOR.—This case is in accord with the weight of judicial opinion on this point. The law may not provide for a change of districts by the property owners, but may, as in the statute passed upon in this case, require the consent of property owners as a condition precedent to a vote of the legislative body of the city upon the change; that body to act upon the proposal for the general welfare of the city as a whole.

Zoning—Constitutionality—Board of Appeals

NEW YORK.—*Dowsey v. Village of Kensington*, Court of Appeals, July 15, 1931.—The village of Kensington has adopted a zoning ordinance placing the entire village, with the exception of a small plot of land, in a single-family use district. The plaintiff, claiming that the restriction of her land, on the edge of this district, bordering upon a road the opposite side of which is in another jurisdiction and zoned for business, is unreasonable, brings this action to obtain a declaratory judgment that the zoning ordinance is to that extent unreasonable and void. The ordinance creates a board of appeals and provides for an appeal to it for a variance in particular cases; but the plaintiff has not seen fit to appeal to it in this case. The village is small, and the ordinance does not attempt to segregate in appropriate places within the village all the activities of communal life. It relegates business and industry to a very small section of the village not adapted to business, and excludes elsewhere even residences, excepting one-family houses. For several years no expensive residences have been erected upon the highway in question; this, main, highway being better suited for business or apartment buildings, and more valuable for this use.

Held, that the plantiff is entitled to a declaratory judgment at this time that as to her the ordinance is unreasonable and void.

The village claims that until a plaintiff has applied for a variance to the board of appeals, and been refused, he has not exhausted the remedies provided by the ordinance, and his action is premature. The plaintiff, however, urges that the regulation itself is invalid and seriously affects the value of her property, since she may desire, not to erect a business structure, but to sell; and the uncertainty would lessen the amount she would obtain. The Court therefore considers that there is a present invasion of plaintiff's rights, and grants the relief applied for.

Streets—Closing

NEW YORK.—*Matter of Cox v. Board of Estimate and Apportionment of the City of New York*, 140 Misc. 313.—The closing of a public street upon which certain property abuts does not entitle the owners of such property to damages if reasonable access by other streets to it remains.

Zoning—Non-Conforming Use

NEW YORK.—*Matter of Eaton v. Sweeney*, 232 App. Div. 459—Different and temporary non-conforming uses which were abandoned before the passage of the ordinance do not give a vested right to the continuance of such uses and do not entitle petitioner to a permit as a matter of right.

Zoning—Incidental Use

NEW YORK.—*Matter of Earl A. Gillespie, Inc., v. Olena and others constituting the Board of Appeals of the Village of Garden City*, 233 App. Div. 770. —The proposed use of appellants' premises for a woodworking shop, incidental to its retail lumber business, is not a violation of the zoning ordinance of the village. Such operations cannot constitute a sawmill or planning mill within the meaning of the ordinance.

Boards of Appeal in New Jersey

NEW JERSEY.—*Jannarone v. Board of Adjustment of Nutley*, 163 Atl. 256.—In *New Jersey Municipalities* for August, 1931, Spaulding Frazer makes the following important comments on the above case, saying of it that it "is the first case construing the limited powers of the Board of Adjustment under the Enabling Act of 1928. It establishes three interesting propositions: first, that the Board of Adjustment was absolutely limited to the making of variances under Section 9, Subdivision 3, in respect of lands abutting a district where such use is authorized; secondly, it reaffirms the judicial nature of the Board of Adjustment proceeding and the principle that the Court will not interfere therewith unless without support in fact or law; and thirdly, that constitutional objections, either under the state or Federal constitution, no longer lie since the adoption of the constitutional amendment. As to the attitude of the courts in the review of actions by the Board of Adjustment see also *Weberlin v. Wigton*, 153 Atl. 104."

Board of Appeals—Variances for a Limited Period

NEW YORK.—*People ex rel. St. Albans-Springfield Corporation v. Connell*, Court of Appeals, reported in *N. Y. Law Journal*, July 30, 1931.—Where, pursuant to building zone resolutions, certain property is placed in a business district and it appears that the property is merely farm land and not at present suitable for business, and the owner desires to maintain a gasoline station on the premises, *held*, that on order of certiorari from the determination of the Board of Standards and Appeals of New York City, a court may properly permit the use of the land for that purpose until such time as the development of the city makes the property suitable for business purposes.

Dedication

NEW YORK.—*Waldash Realty Corporation v. Absar Realty Co., Inc.*, Supreme Court, Bronx County, reported in *N. Y. Law Journal*, July 28, 1931.—A way established by one for his own convenience and use does not become a public way because the public also use it with the owner's permission.

Zoning Ordinance—Amendment

WISCONSIN.—*City of La Grosse v. Elbertson*, 237 N. W. 99.—Unconstitutional ordinances may be amended and made effective by subsequent amendment.

Boards of Appeal—Variance—Reconsideration of Decision

It has frequently been decided by the courts that a board of appeals, having rendered a valid decision with regard to an application for a variance, may render a new decision only when there has been a change of facts since the last decision. An interesting discussion of this question, with a citation of authorities, will be found in an editorial in the *N. Y. Law Journal* of July 27, 1931.

ZONING DECISIONS FOR 1930 as reported in The American City are indexed in the 1931 Municipal Index, and supplement the six years' cumulative record of the 1930 Index.

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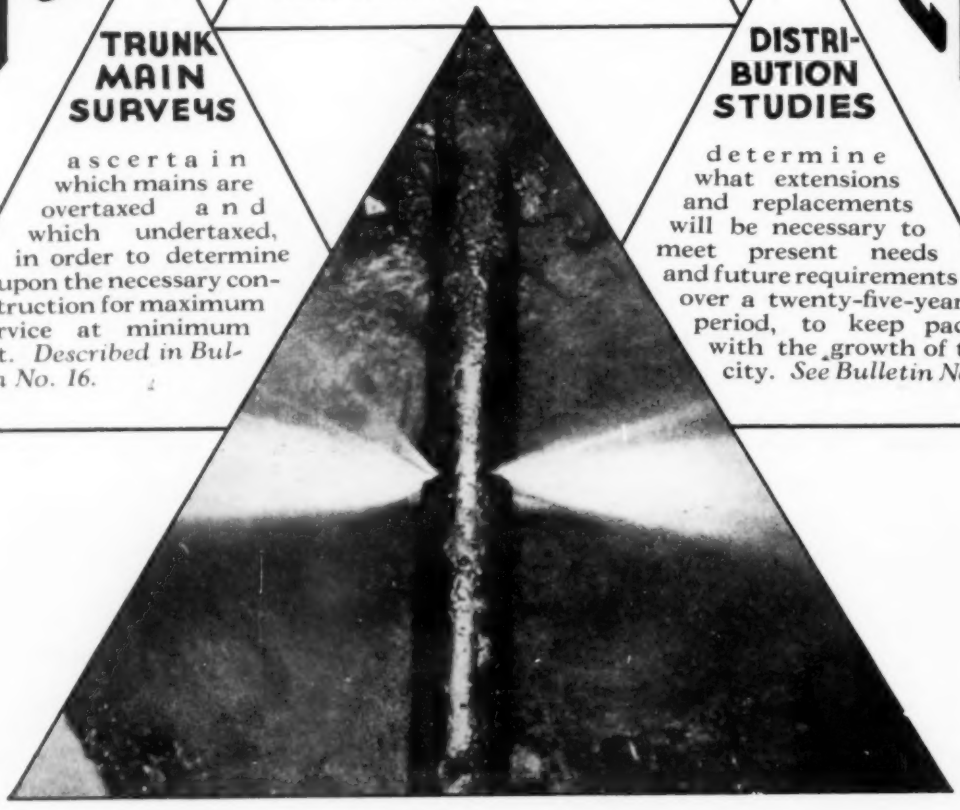
ascertain which mains are overtaxed and which undertaxed, in order to determine upon the necessary construction for maximum service at minimum cost. *Described in Bulletin No. 16.*

DISTRIBUTION STUDIES

determine what extensions and replacements will be necessary to meet present needs and future requirements over a twenty-five-year period, to keep pace with the growth of the city. *See Bulletin No. 16.*



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THE TAXPAYER'S DOLLAR

A Monthly Department of Budgeting, Assessment, Taxation, Accounting and Other Phases of Municipal Finance, Conducted by A. E. BUCK, National Institute of Public Administration, New York

A Ten-Year Tax Program Suggested for Kansas City

RECENTLY Kansas City, Mo., adopted a ten-year improvement program, which is to be financed by the issuance of bonds—$32,000,000 in the case of the city, and $7,950,000 by the county. Before these bonds are retired, there will be an increase in property tax rates reaching as high as approximately 19 per cent.

The Kansas City Public Service Institute has suggested that if some study is given to a tax program, it would be entirely possible to carry out the ten-year improvement program with practically no increase in the total tax rate, except during the first few years. It proposes certain things which are entirely possible of accomplishment if the business men and taxpayers of the city get behind them. These are as follows: (1) To make the Water Department entirely self-supporting and pay all interest and retirement on its bonds. At the present time, the Department pays only a part of the interest on its bonds. (2) To improve the condemnation and special assessment procedure and adopt more equitable means of distributing assessments. A one cent per gallon gasoline tax is suggested in this connection. (3) To provide for the scientific assessment of real estate. (4) To make a more complete and better assessment and collection of personal property taxes. (5) To simplify the structure of the county government. (6) To consolidate the city and county tax assessment and collection offices. (7) To consolidate the city and county governments. (8) To adopt modern personnel methods in both city and county governments. (9) To adopt modern, scientific purchasing methods in city and county. (10) To provide for permanent registration of voters and simplification of election procedure. (11) To conduct efficiency studies of all city and county activities.

The Institute regards these as the major items in a ten-year tax program. If fully carried out, it thinks that the saving would amount, before the end of the tenth year, to about $3,000,000 per year on the general property taxes.

Arguments Against Fee-Supported Offices

THE Philadelphia Bureau of Municipal Research points to the experience with the local Recorder of Deeds as an example of a fee-supported office which is quite unsatisfactory. In 1930, this officer, who is allowed to spend the fees which he collects for the salaries and expenses of his office, collected $366,969.20 and spent $643,758.19, leaving a deficiency of $276,788.99. This was done on the assumption that a deficit might be incurred during the current term, since in previous terms the Recorder's fees had exceeded his expenditures. In arguing against the continuance of this situation, the Bureau says:

"In the long run the requirement that salaries be paid out of fees probably does more harm than good. It sets up an entirely false standard for expenditures. The view is surprisingly prevalent that expenditures are justifiable so long as they do not exceed fees, and that the Recorder earns the public's gratitude whenever he spends less than his fees. The truth is, of course, that the Legislature fixes the fees, that the public has no choice but to pay them, that the Recorder can neither increase nor decrease the number of transactions for which fees are collectible, and that the true standard of expenditure is the fair cost of doing the work in an up-to-date and efficient manner. It has been demonstrated that if modern methods were installed and this fair cost realized in the Philadelphia's office, the fees could be substantially reduced without creating deficits, or, if the fees were maintained at their present level, the deficits would become substantial surpluses and the surpluses would become much larger surpluses. The bearing of this on the amount that has to be collected from the taxpayers is obvious."

Audit of Schenectady's Finances Shows Needed Changes

AN audit of the finances of Schenectady, N. Y., recently made by the New York State Department of Audit and Control, reveals some necessary changes which should be made in the city's financial procedure, according to the local Bureau of Municipal Research. The Bureau regarded as purely incidental the fact that the auditors reported a defalcation of about $9,000 in the City Treasurer's office. It regarded as more important the need for a new accounting system in this office. The present system does not furnish adequate information concerning transactions, and results in a lot of superfluous work.

In the second place, the Bureau regards the findings of this audit as indicative of the need for a continuous audit by the city of both income and outgo. At the present time there is practically no audit of income. The City Comptroller checks actual expenditures, but he does not keep an adequate record of incumbrances or commitments.

In the third place, the Bureau points to the alleged falsification of accounts at the City Isolation Hospital. This has resulted in the disappearance of city funds. Central accounting control is suggested as the remedy for this situation.

Finally, the Bureau calls attention to the conditions which exist with regard to unpaid assessments for street, sewer and other improvements in the city. This situation is termed "almost incredible." For some eight years delinquencies have been allowed to accumulate. No sales of property have been made. The owners of property on which the assessments are delinquent still enjoy the use of the property; some for more than eight years. The total delinquent assessments for local improvements, as of December 31, 1930, was reported to be $1,699,720.74. The law, until a few months ago, left it to the City Council to initiate sales. By an amendment to the law, that responsibility is now placed on the City Treasurer, and the proceeding is made mandatory. The Treasurer has indicated that he will attempt to carry out the new law. The Bureau intends to assist him in meeting the various administrative problems that will inevitably arise in this connection.

Kansas Adopts a Local Budget Law

THE Kansas Legislature of 1931 adopted a law (Ch. 310) requiring each local taxing body within the state to prepare and publish a budget. While the law does not set up a complete budgetary procedure, the Bureau of Governmental Research of Kansas City, Kans., believes that it will have a salutary effect on the financial management of the local governments. Although there are no provisions with reference to the execution of the local budgets, the mere fact that financial plans must be prepared and published, and hearings held on them, is deemed to be an auspicious beginning. Very few of the local units of government in Kansas have any kind of budgetary procedure at the present time.

Ohio Supreme Court Reverses Decision on Special County Bonds

THE Ohio Supreme Court recently announced a reversal of its decision, handed down in February, in the Allen County sewer bond case. The latest decision upholds the validity of the improvement bonds issued by sewer and water districts and guaranteed by the county. This action is quite important, since the original decision had cast serious doubt upon the validity of millions of dollars of outstanding municipal and county obligations, and is reported to have practically brought to a standstill nearly all public improvement work of this character in the state.

A holder of certain sewer and water district bonds upon which interest payments had been defaulted owing to fail-

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ure of special assessments to meet district obligation, brought the original action (*Bowman v. Board of County Commissioners of Allen County*). A writ of mandamus was sought to compel the county, named as guarantor, to levy a general tax sufficient to pay off the interest then due. The Supreme Court in its first decision declared that this could not be done, because the work for which the bonds had been issued did not benefit the entire county. This immediately made some $200,000,000 of such bonds of doubtful validity, and practically held up the sale of additional bonds which several municipalities and counties were attempting to market. This condition prompted the State Attorney General to intervene and request a rehearing of the case, which was granted, with the reversal of decision noted above.

San Francisco's Bonded Debt Status

THIS is the title of a pamphlet recently issued by the San Francisco Bureau of Governmental Research. It states that the total outstanding bonded debt of the city on July 2, 1931, was $152,597,300. The increase in this amount during the previous twelve months totaled $14,868,900. Part of the bonded debt is regarded as self-supporting; about $71,000,000 must be paid out of general taxes, the remainder being met largely from municipal utility earnings of one kind or another.

The Bureau criticizes the unduly long term of many of the bonds issued by the city. Some bonds run for as long as 48 years, and 30- and 40-year bonds are quite common. In this way, as much as $10,000,000, the Bureau claims, has been added to the taxpayer's costs of the projects financed by bonds. Some of the capital improvements thus financed have been of a recurring nature, and therefore, the Bureau thinks, should not have been paid for out of bonds.

The present trend in the city's financing is toward the practical application of "pay-as-you-go." This method has been applied in school construction, and to some extent in park, playground, airport and other developmental programs. The new charter is expected to expedite the further application of the method. Provision has been made for a tax-collection reserve or revolving fund. This fund is intended to obviate the necessity of proposing bond issues to the people to finance small projects, and also to provide money for paying current bills during the several months in each fiscal year prior to the receipt of taxes.

Cleveland Without an Annual Report for Fourteen Years

THE Citizens League of Cleveland reports that city to have been without an annual report of its activities for fourteen years. Not since Newton D. Baker retired from the mayoralty, says the League, has there been an accounting by the city officials for their acts. Even worse, the citizens, if they are a mind to make the search, will not find in the departmental files the desired information in any systematic form. The city's record keeping, asserts the League, is in a deplorable state. It is entirely without credit to the city government.

The League maintains that for five years it has been trying to induce the Council and the City Manager to find some way to prepare, print and distribute an annual report. While they admit that it is desirable, nothing has been done. No incentive seems to come from what many other cities do in the issuing of readable, informative, and attractive annual reports. Even the fact that another large manager-governed city in Ohio, namely Cincinnati, gets out something of a model annual report has no effect on the Cleveland city authorities.

Detroit May Resort to Fiscal Legerdemain, Says Bureau

UNLESS satisfactory means are found of financing the cost of the city government during the current year, says the Detroit Bureau of Governmental Research, the city authorities will face the difficult task of producing fiscal rabbits from an empty treasury. The result will be deferred payrolls and expensive injury to the city's credit.

The existing situation, the Bureau states, came about in this way. Taxes have not been levied for $18,000,000 spent in two years for welfare relief, or for $7,500,000 of expenditures for other departments. Last year's taxes have not been paid to the extent of $11,000,000. The city has advanced nearly $26,000,000 for capital improvements which are not yet financed. All told, the city has had to borrow $62,000,000 on short-term loans, all of which come due September 1. Tax collections before that date are not expected to relieve the situation very much.

The Committee on City Finances (the Stone Committee) estimates that the short-term loans of the city will have increased in another year to $85,000,000 or more, if drastic curtailments in expenditures are not made in the meantime. This Committee therefore suggested to the Mayor and Council the following proposals: (1) great reductions in expenditures for unemployment relief; (2) sharp retrenchment in appropriations for operation of city departments; (3) reorganization of city departments on reduced expenditure basis; (4) expeditious spreading of special assessments after the completion of improvements; (5) curtailment of all public improvements, except those essential to health and safety; (6) discontinuance of local improvements in districts having a substantial tax or assessment delinquency; (7) curtailment of the operating budget in accordance with quarterly revenue receipts; (8) expeditious collection of delinquent taxes; (9) rigid economy in the preparation of the Wayne County budget for the next fiscal year. Even so, a part of the floating debt would probably still have to be funded.

Gasoline Tax Levied by Albuquerque, N. Mex.

THE city of Albuquerque, N. Mex., has levied a tax of one cent a gallon on all gasoline sold within the city between June 15 and October 15. The funds derived from this tax will be used to surface the new riverside drive between the Barelas and Old Town bridges. The tax is levied on gasoline distributed to retailers or used within the city limits. It is expected to yield about $13,000 for the period levied.

The Municipal Bond Market

By **SANDERS SHANKS, JR., Editor, *The Bond Buyer***

FOLLOWING a slump of considerable proportions from the peak prices recorded up to June 1, the municipal bond market showed signs of recovery in August, despite the inactivity which is usual at this period and was a characteristic of the market this summer.

The wide spread between the first grade and other bonds continues to be the outstanding feature of the business. This is true of all kinds of investment securities and indicates the extreme cautiousness of capital during the world depression. Municipalities enjoying less than the highest credit rating cannot finance capital improvements on particularly attractive terms and, unless needs are urgent, would probably do well to postpone such activities until there has been a revival of investment interest in medium grade securities.

An interesting example of a prominent city with second grade credit paying through the nose for funds is Detroit, Mich. A $30,000,000 loan arranged for a term averaging less than three years is costing the city almost 6 per cent.

A representative list of sales follows:

Amount	Municipality	Rate (%)	Maturity	Net Basis (%)
$21,000,000	Metropolitan Transit District, Mass.	2¾	8 mos.	2.75
125,000	Abington Tp., Pa., Sch. Dist.	4¼	20-yr. (avg.)	3.63
250,000	Bangor, Me.	4	10 2/3-yr. (avg.)	3.73
6,480	Adams Co., Ind.	4½	5¾-yr. (avg.)	3.82
65,000	Fond du Lac, Wis.	4	10 2/3-yr. (avg.)	3.91
2,200,000	North Dakota	4, 4¼ & 4½	13 2/3-yr. (avg.)	4.18
32,500	Marietta, Ohio	4¼	5 2/3-yr. (avg.)	4.21
160,000	Danville, Va.	4½	1-20-yr. (ser.)	4.36
206,000	El Paso, Texas	4½	12-yr. (avg.)	4.46
112,000	Glen Rock, N. J.	4¾	3¼-yr. (avg.)	4.65
6,000,000	Golden Gate Bridge and Highway Dist., Calif.	4¾	30½-yr.	4.74
150,000	Leflore Co., Miss.	5	8-yr. (avg.)	4.81
15,000	Guadalupe Co., N. Mex., Sch. Dist.,	5	3-17-yr. (ser.)	4.98
110,000	Inlet, N. Y., Water Dist.	5.20	5-26-yr. (ser.)	5.18
325,000	Wilson, N. C.	5½	18½-yr. (avg.)	5.36

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THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Municipal Contracts

City held not entitled to limit purchase of water meters to those made by one company.

Where a city was buying 3,000 water meters, it had no right to reject a low bid because of a desire to standardize meters of another make, decided the Pennsylvania Supreme Court in the case of *Pearlman v. City of Pittsburg*, 155 Atl. 118. Responding to a suggestion that, because most of the meters in local use were of a certain make, it was desirable to install new ones of the same kind, the Court observed:

"No such requirement is suggested in the specifications. . . . Furthermore it cannot be held that the city could limit the purchase of water meters to those made only by one company. To do so would stifle competition. . The specifications here are, as indeed they must be, if possible, such as to afford reasonable opportunity for competition. . . . Where the article is under a patent and can be obtained only from one source, a different rule prevails. . . .

"Again, the director suggested that meters should be bought of a local company because of the greater facility in obtaining repair parts, but space is provided by the city where a non-resident company can store such parts. Moreover, mere convenience of performance cannot be considered in the award of municipal contracts."

Municipal Finances

Statute permitting summary judicial investigation of municipal finances held valid.

New Jersey has a 50-year-old statute permitting a Supreme Court justice to investigate, through experts, complaint by at least 25 freeholders that moneys of their municipality have been illegally expended. Approving allowances made to experts under this act, the New Jersey Supreme Court said in the late case of *North Bergen Township v. Gough*, 154 Atl. 113:

"The Legislature clearly meant this statute to be the channel whereby a minority, having reason to suspect the unlawful or corrupt use of the moneys of the municipality, may present their apprehensions to a justice of the Supreme Court, whereupon that high judicial officer shall make an investigation, and thereupon, if he be satisfied of the propriety of so doing, may at his discretion appoint others, experts, to prosecute the investigation. There was thus set up a quasi-judicial method, not of charging an offense or causing trial thereof, but of ascertaining and, if so the judicial officer should determine, of publishing the facts of a very particular and vital phase of governmental activity, namely, the handling of public funds. In any event, the investigation may be regarded as an effort to ascertain the truth of a charge involving the swindling of the government out of its money. . . .

"It is not to be assumed that a Supreme Court justice, with the volume of work necessarily resting upon him, can take the time, personally, to examine fully into a complicated system of modern municipal financing and, if there be concealed irregularities, to sift-through skillful efforts at deception. Being satisfied, by such preliminary inquiry as he personally may make, of the occasion for an extensive investigation, he must almost of necessity exercise the discretion vested in him by the statute and appoint others to prosecute the investigation."

Important Legal Decisions

involving municipalities, as reported in this department during 1930, are indexed and classified in the 1931 Municipal Index. This reference list, commencing on page 147 of the 1931 Index, supplements similar lists appearing in the 1930 and 1929 volumes, while the 1928 Index contained a list covering 1924 to 1927, inclusive.

Police Regulations

Requirement that draymen, etc., report movement of household goods, etc., upheld as measure to prevent fraudulent concealment.

An ordinance of New Orleans, requiring draymen, etc., to report to the chief of police movement of household goods or personal effects, other than baggage, from one place to another within the city, was declared by the United States Circuit Court of Appeals, Fifth Circuit, to be valid, in the case of *Schick v. City of New Orleans*, 49 Fed. 2d, 870. Said the Court:

"Persons having business relations with residents of a large city, or having liens upon, or other property interest in, household goods or personal effects other than baggage in the possession or custody of such residents, may be prejudicially affected by the clandestine moving of such household goods or personal effects when such a resident is changing his or her abode. Such a report as the ordinance in question provides for may be a means of preventing the successful concealment of household goods or personal effects stolen or fraudulently obtained or intended to be fraudulently concealed. It is for the branch of the government which is vested with the police power to determine whether such a regulation as that provided for by the ordinance in question should or should not be adopted as a means of preventing or aiding in the detection of crime, or for the protection of contract or property rights of a class or classes of citizens; that regulation being such a one as reasonably may be considered to be appropriate to promote the accomplishment of the purposes mentioned."

Street Lighting

City held not liable to motorist who ran into an elevated embankment at a street end.

A motorist's claim for damages for injuiries sustained through his car colliding with a dirt embankment at the end of a street, was dismissed by the Pennsylvania Supreme Court in the case of *O'Rourke v. City of Washington*, 155 Atl. 100. The Court said:

"Generally speaking, there is no legal duty on the part of a municipality to light its thoroughfares or streets, and it cannot be held responsible for mere insufficiency of light. . . . The failure to exhibit a red light or other signal at a point where an accident might happen because of mere unfamiliarity with the neighborhood on the part of drivers of automobiles, is not sufficient to charge a municipality with negligence in an action similar to the present. . . . Where there is an obstruction or dangerous condition in the roadway, such as a rope stretched across the highway in such a way as to be out of the range of the direct rays of automobile headlights, the city authorities may be held responsible because of the inadequacy of the warning."

Municipal Territory

Incorporators of village held justified in making ample territory provision for expansion on account of oil development.

That a village had less than 600 inhabitants did not bar its incorporation to cover a square mile of territory, where rapid development was probable on account of a newly discovered oil field nearby. Reaching this conclusion in the case of *State v. Hellman*, 36 S. W. 2d, 1002, the Texas Commission of Appeals said:

"As a result of the discovery of this oil field, the population began to increase, and it reasonably appeared that the proposed city would have a very rapid growth. The Court, in determining whether the amount of land included within the city limits was reasonably necessary to take care of the future growth of the city, could properly consider as a matter of judicial knowledge the fact that the development of an oil field adjacent to a town is reasonably calculated to bring about a large increase in population as well as in industrial enterprises. Because of such fact it was permissible to include more unused land

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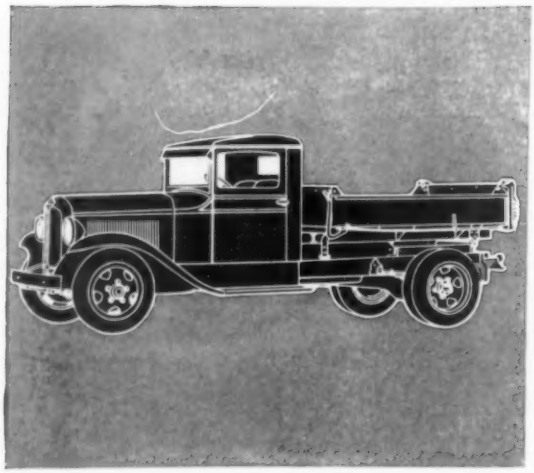

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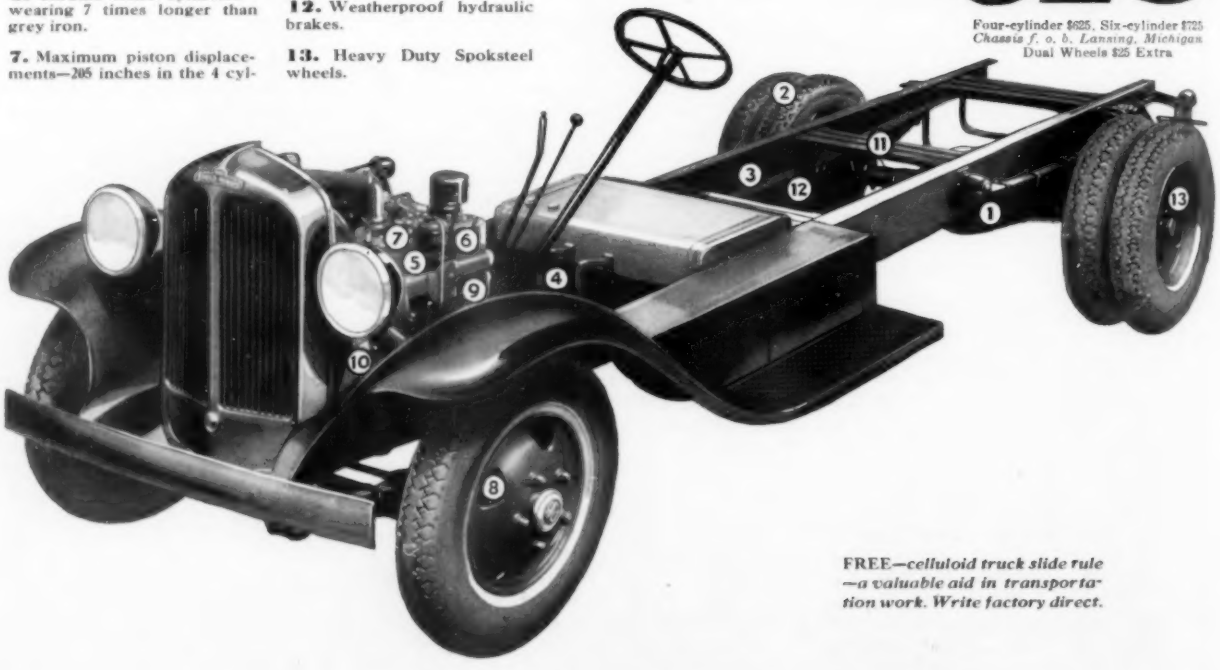

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within the corporate limits than under ordinary circumstances would be considered sufficient to take care of the future growth of a city of this class."

License Taxes

Ordinance discriminating between residents and non-residents, in levying occupation taxes, declared void.

Adhering to a rule recognized in the case of *Irish*, 250 Pac. 1056, the Kansas Supreme Court, in *Hair v. City of Humboldt*, 299 Pac. 268, pronounced to be void an ordinance purporting to levy a tax of $1.50 per day, or $120 per annum, against non-resident bakers doing business in the city, whereas the tax against resident bakers was only $1 per day or $10 per annum. The Court said:

"In the ordinance we are now considering, those selling bakery products are classified as those owning and operating a fixed place of business in Humboldt and those not owning such a fixed place of business. Appellant argues that this is a reasonable classification and does not come under the rule in the *Irish* case. We are not impressed with this distinction. This Court takes judicial notice of the local situation at Iola and Humboldt and the general business and economic conditions there. The ordinance that provides for a higher license for one selling bread without a fixed place of business in Humboldt than for one who has a fixed place of business really means that a non-resident of Humboldt shall pay the higher rate. This being the case, all that was said in re *Irish*, supra, could be said in this case."

Storm-Water Sewers

A city is not liable for overflow of sewers due to extraordinary storms or floods.

It being found that defendant city's storm sewer was sufficient to carry off water under ordinary conditions, the city was not liable for flooding of private property, due to an extraordinary storm, decided the Connecticut Supreme Court of Errors in *Spitzer v. City of Waterbury*, 154 Atl. 157. In the course of its opinion the Court observed:

"If, apart from any defect in the plan, the city's employees had so negligently and improperly constructed the outlet of this storm-water sewer that, under conditions reasonably to be anticipated, it would not carry off the water collected by it, the city would be responsible for damage directly resulting to the plaintiffs' property. The Court has not found that the city was negligent in the construction of the storm-water sewer, and the plaintiff's case is not based upon such a claim. . .

"The default upon which they relied, in stating this cause of action, was the failure of the city, in planning a storm-water disposal system, to adopt a plan which provided an outlet of sufficient size adequately to dispose of the water discharged by the storm-water sewer into the covered stream. Such a defect in the plan upon which the system was constructed, if one existed, was the result of an error of judgment on the part of the officers of a public corporation on which has been cast the burden of discharging a governmental duty of a quasi-judicial character. . . . For consequential damage resulting from the failure to discharge such a duty, the defendant is not liable. . . .

"But the rule which thus exempts municipalities from liability while acting in the discharge of a public duty does not relieve them from responsibility 'for the consequences of the particular acts which the municipality has directed to be performed, and which from their character, or the manner in which they are so ordered to be executed, will naturally work a direct injury to the property of others, or create a nuisance, or occasion a wanton injury to the property or rights of other persons.' . . . Where, therefore, the plan of construction is such as necessarily results in a nuisance to abutting property owners, or is so obviously inadequate as necessarily to result in a direct trespass upon their property, the municipality cannot claim immunity, since such a result would constitute an appropriation of property without compensation."

Street Accidents

City held not liable for negligent operation of street sweeper, resulting in automobile accident.

Immunity from liability for negligent performance of governmental functions protected defendant city from liability for injury resulting from collision between an automobile and a street sweeper operated by the municipality, according to the decision of the Alabama Supreme Court in *Densmore v. City of Birmingham*, 135 So. 320.

And liability could not be based upon a theory that the street sweeper was so operated as to be a nuisance—an unlawful obstruction in the street—the Court decided. On this point the opinion reads:

"A permanent obstruction in a street in the absence of due authority is a public nuisance. . . . . A different rule applies to so-called temporary obstructions. . . .

"The operation of a street sweeper moving along the street cannot be properly called an obstruction because of insufficient street lights and the failure to display signal lights on its rear. The creation of a nuisance in a street is not therefore effected by the movements of a street sweeper, though negligently operated so as to cause unnecessary injury."

Test of "Public Official"

Specially employed street improvement engineer was not a "public official," and could assign his compensation.

In the absence of statute to the contrary, one specially employed by a city as engineer on local improvements may make a valid assignment of unearned compensation. Supporting the right of an assignee of a street improvement engineer to recover in such a case, the California District Court of Appeal said in *Pacific Finance Corporation v. City of Lynwood*, 300 Pac. 50:

"It is obvious that, unless his [the engineer's] contract with the city made him a public officer, his right to compensation is not traceable to any public office. In the minutes of the meetings held by the Board of Trustees there are frequent references to Schwabland as City Engineer, but this characterization is not determinative of the relationship growing out of the contract. . . . .

"Unless the contract made Schwabland City Engineer, his rights to compensation under the contract are not cut off by attempting to amputate his official head, nor is the principle that the unearned salary of a public official is unassignable applicable. . . .

"The contract did not operate to make Schwabland a public official. It would be futile to attempt to reconcile the many definitions and illustrations of 'public officer.' This much is certain. To have a public officer you must first have a public office, created by the Constitution, Legislature, or some legislative body with delegated authority; an office that exists independently of the presence of a person in it. . . .

"A public officer is not the offspring of a contract. . . . Of interest in making plain the distinction we are emphasizing are the several cases dealing with the rendition of medical services for the public. If the services are contracted for, those serving are not officers. . . . If, however, the services are being rendered by those appointed to offices created by the Legislature, those serving are officers."

War Veterans' Exemptions

Statute interpreted as not exempting a discharged soldier from liability for occupational tax on vehicles not personally operated.

In *Hair v. City of Humboldt*, 299 Pac. 268, the Kansas Supreme Court ruled against the right of a retail baker to exemption from an occupation tax upon delivery vehicles operated by his employees. Citing the Kansas statute, exempting ex-soldiers, etc., from payment of peddlers' license taxes, etc., the Court said:

"We have reached the conclusion that the immunity provided for in the above statute is a personal one. Clearly that is what the language used would indicate. The act refers to the personal operation and ownership of a baggage and delivery wagon owned exclusively by the veteran. The Legislature did not intend that one veteran could hire a number of men to operate bread wagons for him and escape the necessity for paying for a license on the ground that he was a veteran of the World War. This case was decided on the pleadings. The answer alleged that appellee was operating the bread trucks in Humboldt by means of agents and employees. Hence he cannot take advantage of the statute."

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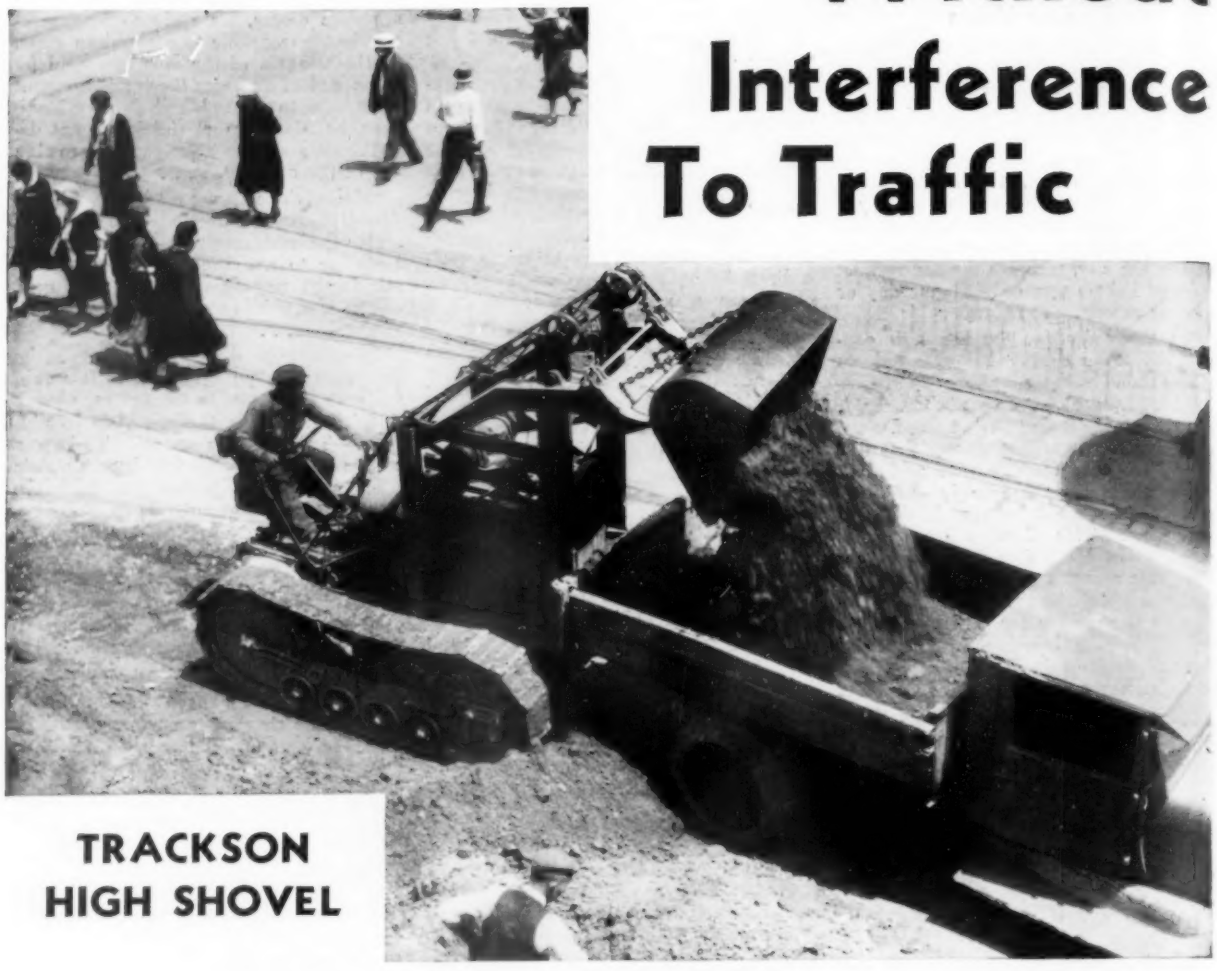

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Water Rates and Regulations

Part V

Water-Meter Rates

Hydrant Rentals and Sprinkler Charges

Regulations Covering Taps and the Installation of Services

(Continued from the August issue)

Daytona Beach, Fla.—16,598

The municipal water department of Daytona Beach charges a rate of 20 cents per 1,000 gallons to all consumers, plus a charge for meter maintenance.

METER MAINTENANCE CHARGE

Size of Meter	Per Quarter	Deposit
¾"	$1.25	$5.00
1"	1.75	7.50
1¼"	2.25	9.00
1½"	2.75	11.00
2"	3.50	14.00
3"	5.00	20.00
4"	6.00	24.00
6"	7.50	30.00

The annual fire hydrant rental charge is $30.00. There is no additional charge for fire sprinkling devices. All valves must be sealed after fires, and the services are inspected each month to be sure that no water is being used.

All new services are paid for in advance, according to the following schedule:

Size of Service	Charge (Including Deposit)
¾"	$22.00
1"	30.00
1¼"	34.00
1½"	40.00
2"	59.00
3"	106.00
4"	181.00
6"	442.00

All meters are installed at the property line and furnished with a curb or gate on the city's side, as well as a valve on the service side. A fine of $25.00 is imposed for turning water off without the permission of the superintendent.

Nampa City, Idaho—8,206

WATER METER RATES

Cubic Feet per Month	Per 100 Cubic Feet
First 400	50c
Next 350	40c
" 500	30c
" 1,000	25c
" 1,523	20c
Over 3,763	12c

Minimum charge, $1 per month. Bills are due on the 1st day of each month for the previous month and, if not paid by the 14th, water will be turned off and will not be turned on again until all charges are paid, including a penalty charge of $1.

When a meter is installed, the consumer is charged $16. Credit is then given each month until the $16 is accounted for, and water is then paid for at the regular rate.

Pocatello, Idaho—16,471

WATER METER RATES

Gallons per Month	
First 5,000	$1.00 per month
	Per 1,000 Gallons
Next 45,000	10c
" 100,000	8c
Over 150,000	5c

MINIMUM CHARGES

Size of Meter	Per Month
½"	$1.00
⅝"	1.00
¾"	1.00
1"	1.50
1¼"	1.75
1½"	2.00
2"	2.50
3"	3.50
4"	6.00
6"	12.00
8"	18.75

For private fire lines and automatic sprinkler systems in private buildings, the charge is at a flat rate, as follows:

Size of Connection	Per Year
Less than 2"	$6.00
2" to 2½"	8.00
2½" to 3"	10.00
3" to 4"	15.00
4" to 6"	25.00
6" to 8"	37.50

Pipes to be used only in case of fire will be allowed within buildings only upon certain conditions. The fire pipe must be entirely disconnected from those used for other purposes, and all pipes or branches must be arranged by means of seals or otherwise, so that they can be used only in case of fire. Should water be used from fire pipes for other than fire purposes, the superintendent of water works shall see that a meter is installed upon the premises.

The city will make connections to the mains and will extend the connection to the line of the property, installing a stop-cock at or near the curb line, as well as a meter. All service pipes inside property lines must be laid to a depth of at least 5 feet below the surface of the ground, and when any such pipes are installed they must be left exposed in the trench for the inspection of the superintendent of water works.

Bloomington, Ill.—30,930

WATER METER RATES

Cubic Feet per Month	Per 100 Cubic Feet
First 900	54c
Next 1,400	45c
" 6,600	36c
" 13,400	27c
Over 22,300	13.5c
Over 1,250,000	6.375c

Where a meter smaller than 1-inch is used, the minimum charge for water is 80 cents per month, and where a meter of 1-inch or larger capacity is used, the minimum charge is $1.50 per inch of capacity or fraction thereof.

All bills are rendered at 10 per cent above the rates named and, if paid on or before the date of the bill, this 10 per cent is not charged. Bills are rendered on the 1st, 10th and 20th of the month in different parts of the city.

The city makes no charge for hydrants and private fire service. All tapping charges and charges for the installation of services are paid by the property owners along the line of the water main.

Peoria, Ill.—104,969

WATER METER RATES

Cubic Feet per Month	Per 100 Cubic Feet
First 800	29¼c
Next 2,400	19½c
3,200 to 133,300	5.85c
Over 133,300	3.9c

A basic room rate of 26 cents per room per quarter is charged for all rooms in any residence served by one meter, with a minimum charge of $1.04 per quarter for each building.

PUBLIC FIRE HYDRANTS

	Per Year
First 1,000, each	$41.60
Each additional	25.00

PRIVATE FIRE SERVICE

Hydrants, each	$54.08
1,000 sprinkler heads, or less, each	0.13
Over 1,000 sprinkler heads, each	0.065
Minimum	65.00

The Peoria Water Works Co. will install the service pipe from the water main to the curb line and the curb cock and curb box. The sum of $3 will be charged for the curb cock and curb box. All service pipes laid by the consumer in the ground or under the basement floor must be of strong lead pipe and laid below the frost line.

Springfield, Ill.—71,864

WATER METER RATES

Cubic Feet per Month	Per 100 Cubic Feet
First 3,000	17½c
Next 5,000	12½c
" 8,000	10c
" 14,000	8c
Over 30,000	7c

MINIMUM CHARGES

Size of Meter	Per Month
⅝"	$0.50
¾"	0.75
1"	1.00
1¼"	2.00
1½"	3.00
2"	6.00
3"	8.00
4"	10.00
6"	20.00

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In 1929 Davey Tree Surgeons served 22,368 clients, and in 1930 they served 26,848—in the far-flung territory from Boston to beyond Kansas City, between Montreal, Toronto and the Gulf.

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1846-1923
Father of Tree Surgery
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DAVEY TREE SURGEONS

A penalty of 10 per cent is added if the bill is not paid on or before the day of the month on which it is due, as shown on the bill. The city of Springfield operates its own Water, Light and Power Department.

East Chicago, Ind.—54,784

The following water rates are effective on all meter readings for the months of May through October, inclusive:

Gallons per Month		Per 1,000 Gallons Gross	Net
First	5,000	31.5c	28.35c
Next	10,000	15c	13.5c
"	10,000	25c	22.5c
"	25,000	20c	18c
"	250,000	15c	13.5c
"	700,000	10c	9c
"	2,000,000	8c	7.2c
Over	3,000,000	6.5c	5.85c

The following charges are made during the remainder of the year:

Gallons per Month		Per 1,000 Gallons Gross	Net
First	10,000	31.5c	31.5c
Next	15,000	25c	22.5c
"	25,000	20c	18c
"	250,000	15c	13.5c
"	700,000	10c	9c
"	2,000,000	8c	7.2c
Over	3,000,000	6.5c	5.85c

MINIMUM CHARGES

Size of Meter	Per Month Gross	Net
⅝"	$1.25	$1.10
¾"	2.00	1.80
1"	3.50	3.15
1½"	5.00	4.50
2"	8.00	7.20
3"	15.00	13.50
4"	24.00	21.60
6"	40.00	36.00

If paid within 10 days, the net charge applies. Otherwise, the gross rate will be charged.

First 500 public fire hydrants...$40,000 per year
Each additional hydrant.....$60.00 per year

FIRE PROTECTION LINES

	Per Year
Fire service from 2" line for standpipe	$20.00
Fire service from 3" line for standpipe	45.00
Fire service for automatic sprinkler service through first 4" line (maximum heads, 700)	60.00
Each additional 4" connection for same property	55.00
Each private fire hydrant	50.00

Taps are made and services installed by the Department of Water Works and charged to the property owner.

Fort Wayne, Ind.—114,946

WATER RATE SCHEDULE

Cubic Feet per Month		Per 1,000 Cubic Feet
First	500	$2.00
Next	4,000	1.20
"	8,000	0.90
"	16,000	0.75
Over	28,500	0.65
Schools, churches and hospitals		0.60

MINIMUM METER CHARGES

Size of Meter	Per Month
⅝" and ¾"	$1.00
1"	2.00
1½"	4.00
2"	6.00
3"	12.00
4"	24.00
6"	48.00

Municipal fire hydrants are charged at $40 each per year, payable quarterly. The same rate applies to fire hydrants on private property. Sprinkler systems and fire line inspection are billed at $40 per year.

Mishawaka, Ind.—28,630

METER RATE SCHEDULE

Cubic Feet per Quarter	Per 100 Cubic Feet
First 8,000	15c
Next 12,000	9c
Over 20,000	7c

MINIMUM METER RATES

Size of Meter	Per Quarter
⅝"	$2.25
1"	4.50
1½"	9.00
2"	12.00
3"	22.50
4"	45.00
6"	60.00
8"	75.00

PRIVATE FIRE PROTECTION

Size of Connection	Per Quarter
1"	$3.00
1½"	4.50
2"	7.50
3"	12.00
4"	16.50
6"	22.50
8"	30.00

No additional charge is made on private fire lines for water used for extinguishing fires.

All service connections are installed by the city and include the corporation cock, lead service pipe from the water main to the curb line, curb cock and stop box. The service connection ends at the curb cock and stop box, which is placed just inside the curb line. The following charges are made for service connections of extra strong lead pipe:

Size of Service	Dirt Street	Paved Street
⅝"	$20.00	$28.00
1"	30.00	40.00

For services larger than 1-inch the city will estimate on the connection on the basis of the actual cost of all labor and material, plus 5 per cent for use of tools, etc. All piping from curb cocks to buildings or fixtures must be of extra-strong lead pipe or the best quality galvanized iron pipe, not less than ¾-inch inside diameter, and must be laid not less than 5 feet below the finished grade.

Valparaiso, Ind.—8,079

WATER METER RATES

Cubic Feet per Month	Per 100 Cubic Feet
1 to 1,200	20c
1,200 to 4,000	16c
4,000 to 24,000	13c
24,000 to 240,000	10c
240,000 and over	8c

Minimum, 50 cents per month.

The consumer pays the cost of connection for private fire service, no charge being made for this service thereafter.

Ames, Iowa—10,261

WATER METER RATES

Cubic Feet per Month		Per 100 Cubic Feet
First	750	30c
Second	750	25c
"	1,500	20c
"	3,000	18c
"	6,000	15c
"	12,000	13c

A discount of 10 per cent will be allowed if paid before the 10th of the month.

METER RENTALS

Size of Meter	Per Month
1"	$0.50
1½"	0.60
2"	1.00
3"	1.50
4"	3.00
6"	6.00

A minimum rate of 75 cents per month, including 285 cubic feet of water, is charged.

If owners wish to lay pipes with hydrants and hose couplings to be used only in case of fire, they will be permitted to connect with the street mains at their own expense upon application to the city manager and, under his direction, will be allowed to use the water for fire purposes only, free of charge.

A water meter, the property of the city, is furnished and installed by the city to every private service connection in use.

No persons except those specially authorized by the city manager will be permitted to tap any water main. The issuance of a water permit is deemed sufficient authority for a master plumber to tap any city main. The sizes of taps in city mains are limited to ⅝-inch in 4-inch mains, ¾-inch in 6-inch mains, and 1-inch taps in 8-inch mains. All taps larger than 1-inch must be made by the city, and the property owner will be charged the actual cost. All service pipe must be laid at least 5 feet below the surface of the ground. A corporation cock of approved make must be inserted in every tap made in the main.

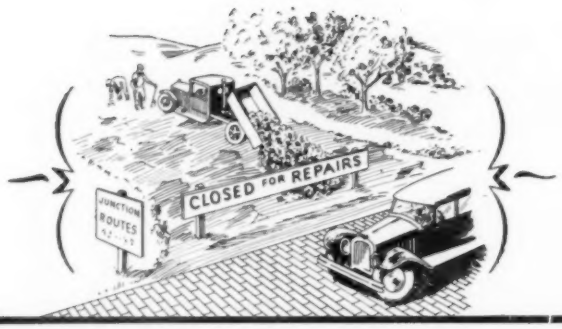
All service pipe from the main to the curb cock must be either lead pipe or copper tubing. A curb cock and curb box of approved design must be installed one foot outside the sidewalk in every service connection. A stop and waste cock must be attached to every service at the point where it enters the building, so as to admit of the water's being shut off in severe weather and the pipe and meter drained.

Mason City, Iowa—23,304

The Mason City Water Works sets a minimum water charge of $1.50 per quarter for the first 3,000 gallons used. For water used each quarter in excess of the 3,000 gallons, the following rates apply:

Gallons per Quarter		Per 1,000 Gallons
Less than	15,000	50c
15,000 to	25,000	45c
25,000 to	35,000	40c
35,000 to	50,000	30c
50,000 to	100,000	25c
100,000 to	700,000	20c
Over	700,000	15c
Over	2,000,000	10c

Private fire hydrants or standpipes will be permitted to be installed under the direction and supervision of the Water Department. No charge will be made for water used for fire purposes, but a charge of $5 per year is made to cover the cost of inspection. Sprinkler systems may be permitted to be attached to the city mains by direct connection, without meters, under the direction and super-



PAVEMENT FAILURE IS DUE TO WEATHER AS WELL AS TRAFFIC

BRICK SURFACE PREVENTS IT

BUILD pavements to withstand *weather* as well as traffic. Otherwise, pavements must fail before their time.

For weathering action is a powerful destroyer. It keeps eternally chiseling away. It makes weak spots for traffic to hammer. It "ups" maintenance costs. It endangers and hinders traffic. Finally a major reconstruction is necessary.

A brick surface prevents weathering. Its non-porous, vitrified exterior keeps water out of the brick itself. Asphalt-filled joints complete the protection to the base. Expansion due to temperature changes is practically nil. And brick withstands even the heaviest traffic punishment.

Brick surfaced pavements are sound from an engineering standpoint. Hence, they are also sound from financial and taxpaying standpoints.

Scores of engineers and taxpayers who have good brick pavements giving cost-free service in their thirty- and forty-odd years will agree that brick is cheapest and best.

For additional information, Address National Paving Brick Association, 1245 National Press Building, Washington, D. C.

FACE the FUTURE in PLANNING ROAD PROGRAMS

DECIDE ON BRICK

Get the Pavement that Lasts

vision of the Department. No open connection may be incorporated in the system, and no valves except a main control valve at the entrance to the building, which must be sealed open. Diagrams of such systems must be filed with the Department, and free access to all parts must be granted to the Department. No charge will be made for water used for fire purposes, but a yearly charge of $5 is made to cover the cost of inspection of sprinkler systems.

The Water Department has undertaken the installation of service lines from the main to the property line, or curb cut-off box, in order to safeguard the interests of the city in the streets and, so far as possible, by the use of the best materials, carefully tested under excess pressure and careful installation, to avoid excessive loss of water. All connections with the city water mains must be made with cast iron pipe and fittings or lead pipe and brass fittings meeting the following specifications: corporation cocks in main and curb cut-off valves must be of approved design; ¾-inch lead pipe to weigh 3 pounds, 8 ounces, or more, per foot; 1-inch lead pipe to weigh 4 pounds, 12 ounces, or more, per foot; and 1½-inch pipe to weigh 7 pounds, 9 ounces, or more, per foot.

Curb service boxes must be of type approved by the Department and located one foot outside of the sidewalk line, with the top on a level with the top of the established sidewalk grade, or one foot inside the established curb where the walk extends to the curb. Service lines must be laid at least 6 feet below the established grade, must rest firm on earth or sand bed and be covered with at least one foot of earth or sand, well tamped to prevent rupture by rock or other material used in filling the excavation. Only ¾-inch or 1-inch taps will be allowed in any main.

Arkansas City, Kans.—13,946

The City Commission of Arkansas City has reduced the water rates, especially to the small consumers, as follows:

Gallons per Month	
First 3,000	$1.00 minimum
	Per 1,000 Gallons
Next 12,000	30c
" 15,000	20c
" 95,000	15c
" 75,000	12c
Excess	10c

The following minimum charges are made to the users of water, based upon the size of meter installed:

Size of Meter	Allowance Gallons	Per Month
⅝"	3,000	$1.00
¾"	6,000	2.00
1"	13,000	4.00
1½"	32,000	8.00
2"	86,000	16.00
3"	151,300	25.00
4"	291,500	40.00

Independence, Kans.—12,782

WATER RATE SCHEDULE

Gallons per Month		Per 1,000 Gallons	Total Cost
First	500	50c	$0.50
Next	4,500	30c	1.85
"	5,000	25c	3.10
"	10,000	20c	5.10
"	30,000	15c	9.60
"	50,000	12c	15.60
"	400,000	10c	55.60
"	500,000	9c	100.60
Over	1,00 ,000	8c	

An advance payment of $1.50 to apply on water consumption and a $4 guarantee deposit are required on each service.

Connections for fire protection are installed at the consumer's expense. No charge is made for sprinkler systems or fire protection of any kind, except the cost of the connection.

The city installs the service to the curb and sets the meter, free of cost to the consumer.

Ashland, Ky.—29,074

WATER METER RATES

Gallons per Month	Per 1,000 Gallons
First 10,000	40c
Next 90,000	30c
" 200,000	25c
" 400,000	20c
" 300,000	15c

Subject to a discount of 5 cents per 1,000 gallons if paid on or before the 10th of the month following that in which water is used. All excess at 10 cents per 1,000 gallons, net.

MINIMUM CHARGES

Size of Meter	Gallons Allowance	Gross	Net
⅝"	2,000	$1.50	$1.00
¾"	5,000	2.00	1.75
1"	8,000	3.20	2.80
1½"	11,000	4.30	3.75
2"	16,000	5.80	5.00
3"	36,000	11.80	10.00
4"	105,000	32.25	27.00
6"	270,000	73.50	60.00

This is a municipally owned water plant, but the city charges for hydrant rental and all water or services furnished to other departments, the hydrant rental being an average of $42.35 per year for each hydrant.

The rate on private fire hydrants is $50 per year for each hydrant. On automatic sprinkler connections the charges are $6 per month for a 4-inch connection and $15 per month for a 6-inch connection, the water works installing and owning the connection between the water main and the cut-off valve at the curb.

All service lines are installed at the expense of the city.

Covington, Ky.—65,252

Cubic Feet per Quarter		
First	1,111	$2.00 Minimum
		Per 100 Cubic Feet
Next	8,889	18c
10,000 to	20,000	16c
20,000 to	30,000	14c
30,000 to	40,000	12c
40,000 to	4,000,000	10c
Over	4,000,000	9½c

The above rates are charged to consumers within the city limits. For consumers outside the city limits the rates are higher. All bills must be paid within 10 days or the water will be shut off and an additional fee of $1.00 charged for turning it on again.

All service pipes and connections for water service are made at the expense of the property owner. A deposit of $40.00 is required with the application to cover the cost of the regulation service pipe and connection. All water meters are the property of the waterworks department and must be placed at curb wherever possible. If placed in the cellar of the building to be supplied, the meter must be protected by a wooden box of sufficient size with a hinged lid and clamp for lock. A stop cock must be placed on both sides of the meter. The service line from the curb or stop cock to the inside of the cellar must be extra-strong lead pipe not less than ½-inch, nor more than 1-inch, in size. Services larger than 1-inch must be of brass, extra-heavy galvanized iron, or no less than Class C cast iron pipe. Service lines must be placed at least 3 feet underground.

Hopkinsville, Ky.—10,746

WATER METER RATES

Cubic Feet per Month	Per 100 Cubic Feet
First 3,000	30c
Next 6,000	25c
" 10,000	20c
Over 19,000	17c

MINIMUM CHARGES

Size of Meter	Per Month
⅝"	$0.70
¾"	1.00
1"	1.30
1¼"	1.50
1½"	2.00
2"	2.60
3"	4.00

Water for manufacturing purposes only is supplied at 12½ cents per 100 cubic feet, without regard to quantity.

For private fire service, including sprinklers, the following rates apply:

Size of Connection	Per Year
2"	$16.00
4"	36.00
6"	78.00

For public fire hydrants the city pays the Hopkinsville Water Co. $40 each per year for the first 102, and $30 each per year for the next 60.

Baton Rouge, La.—30,729

WATER METER RATES

Gallons per Month	Per 1,000 Gallons Gross	Net
First 30,000	44.4c	40c
Next 120,000	33.3c	30c
" 350,000	16.7c	15c
Over 500,000	15c	13.5c

MINIMUM CHARGES

Size of Meter	Gross	Net
⅝"	$1.39	$1.25
¾"	2.22	2.00
1"	3.89	3.50
1½"	10.00	9.00
2"	15.00	13.50
3"	25.00	22.50
4"	30.00	27.00
6"	40.00	36.00

The minimum charge is $1.39 per month. Advance deposits equal to the quarterly meter rates may be required on meters 1-inch or larger. On ⅝- and ¾-inch meters a deposit of $5 may be required, for residence service.

Greenville, Maine—1,615

An interesting combination of using flat rates as the basis for determining the minimum charges for water consumed is in use by the Greenville Water Co., of Greenville, Maine. The charges are as follows:

2 Auto Injuries Every Minute

—that is the appalling toll that modern traffic takes of our citizens. Four deaths and 109 injuries every hour of the day —averaging the actual figures on traffic accidents in 1930!

What can be done to safeguard *your* citizens? The bloody flood is still rising in 1931—*except* in those cities that maintain adequate Safety Patrols of motorcycle police.

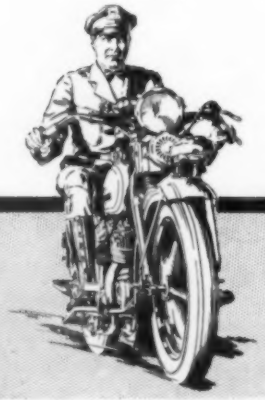
There is the clue. Motorcycle officers can and do make traffic safer. When motorists drive more carefully, accident totals shrink swiftly. Cities with the best records of accident prevention use fleets of police motorcycles — most of them Harley-Davidsons. How well are *your* citizens protected?

HARLEY-DAVIDSON MOTOR CO., Dept. M, *Milwaukee, Wis.*

—the answer is

MORE MOTORCYCLE POLICEMEN

Study the facts and judge for yourself. Send for a free copy of "The Bloodiest Page in American History"—a folder that will tell you much about traffic accidents, traffic control, and the Harley-Davidson Police Motorcycle. Write for it today.



HARLEY-DAVIDSON

The Police Motorcycle

	Per Year
First faucet	$13 00
First additional faucet	4 00
Each further additional faucet	3 00
First bath tub	5 00
Each additional bathtub	3 00
First toilet	6 00
Each additional toilet	3 00
Private stables:	
One horse, including water for carriage washing	6 00
Each extra horse	3 00
Each cow	3 00
Automobiles each, per season	5 00
Sill cock, per season	6 00
House heating boilers, each per season	2 00
Building purposes:	
For each cask of lime, cement or thousand brick	0 08
Sprinkler heads, each per year	0 15
Minimum service charge. The minimum charge for one or more fixtures for any use is	13 00

All services are metered, and each tenement and each family in a building will be charged according to the fixtures used, whether separately or in common, and whether measured by one or more meters (provided, however, that the use of water for cows or horses in a stable or in a pasture shall be considered a single use) with an additional charge of $2 per year for each additional meter.

A consumer is entitled to use 6,500 gallons of water in any one quarter for a minimum quarterly charge of $3.25, and at the rate of 2,000 gallons for each additional dollar of the fixture rate named in this schedule. All water used in excess of the maximum amount allowed on payment of the fixture charges will be charged for at the rate of 50 cents for each 1,000 gallons.

METER RATES

For Manufacturing Industries, Railways, Public Garages and Schools

Cubic Feet per Month	Per 100 Cubic Feet
First 400	50c
Next 2,600	30c
" 6,000	25c
" 6,000	18c
" 15,000	14c
" 20,000	10c
" 20,000	7c
" 20,000	5c
Excess over 90,000	4c

The rates provided for manufacturers and railroads will be applied to hotels and boarding houses having not less than 30 guest rooms, provided that they remain open and use the service throughout the 12 months of the year.

Hydrants are charged for at the rate of $65 per year. In the case of municipal hydrants, this charge is in excess of any amount paid or assessed by the municipality for taxes.

The water company makes the tap in the main and installs the service to the road line on the side of the street on which the property is located, the consumer installing it from there to the premises in which it is located. The water company maintains the service to the street line, and the consumer the remainder of the way.

Milo, Maine

METER RATES

Gallons per Quarter	
First 4,000	$4.75 minimum
	Per 1,000 Gallons
Next 6,000	75c
" 10,000	55c
" 20,000	40c
Excess	9c

PRIVATE FIRE PROTECTION SERVICES

	Per Year
Hydrants, each	$40 00
2" fire hose connections, each	10 00
1" fire hose connections, each	5 00
Sprinkler heads, each	0 10
MUNICIPAL SERVICE	
Public hydrants, each	$150 00
Watering troughs, each	30 00
Standpipes, for street sprinkling purposes, each	25 00

The cost of construction in connection with the laying of all service pipes from the building to the street line is paid by the consumer. The Milo Water Co. will lay the pipe from the main to the curb. Every service must be provided with a stop and waste cock on the inside of the cellar or foundation wall and near where the pipe passes through, easily accessible and fully protected from freezing.

All meters are the property of the company and are installed, moved and removed by the company. For each original installation or change of location within the building served there is a charge of $5.

Bel Air, Md.—1,650

The minimum quarterly rate is $4.00 and covers the use of water not exceeding 3,000 gallons. Water used in excess of 3,000 gallons per quarter is to be paid for at the rate of 60 cents per 1,000 gallons.

All rents are due on the first of the month and must be paid at the office of the Bel Air Water & Light Co. on or before the 15th, or the company may turn off the water and will not turn it on again until all back rents and an extra charge of $2.00 for turning off and on, are paid. A discount of 5 per cent is allowed from the 1st to the 10th. After the 15th a penalty of 10 per cent is added.

Connection with the main will be made and piping to the point where the meter is to be installed, including curb box and stop, will be laid and kept in repair by the company and charged to the consumer at actual cost of material and labor, with 10 per cent for supervision. Meters will be furnished, installed and maintained at the expense of the company and shall always remain the property of the company.

Fairhaven, Mass.—10,951

The rates charged by the Fairhaven Water Co., Fairhaven, Mass., are as follows:

Cubic Feet per Year	Per 100 Cubic Feet
Less than 13,333 1/3	33 8c
13,333 1/3 to 66,666 2/3	28 2c
66,666 2/3 to 200,000	22 5c
Over 200,000	15c

The minimum charge is $15.00 per year, payable semi-annually.

Each consumer must provide at his expense a meter of a pattern approved by the company.

The city pays $50.00 per hydrant per year, there being no charge for private hydrant or sprinkler service. Installation of all private fire services, private hydrants and sprinkler services from the main is paid for by the consumer. Taps for other uses are run by the water company from the main to the main stop in the cellar, and the consumer is charged for installation from the curb to the cellar.

Lexington, Mass.—9,467

The quarterly minimum charge of $3.75, payable in advance, entitles the consumer to 1,250 cubic feet. Additional amounts are charged by the Department of Public Works of Lexington, at the following rates:

Cubic Feet per Quarter	Per 100 Cubic Feet
First 10,000	30c
Next 20,000	25c
" 20,000	20c
Over 50,000	18c

The annual hydrant rental is $15.00 each, no charge being made for either sprinkler or fire services.

Taps are made and all service work done by town employees. In some instances permission is given the property owner to install his own pipe from the curb line to the house, where there is a good excuse for his doing so. The work is then done under the supervision of a Water Department agent.

Hagerstown, Md.—30,861

The minimum rate for domestic consumers of water served by the Board of Water Commissioners of Hagerstown, Md., is $10.00 per year, payable quarterly. The sliding scale of rates is as follows:

Gallons per Quarter	Per 1,000 Gallons
First 10,000	30c
Next 12,000	25c
" 24,000	20c
" 120,000	18c
" 270,000	15c
" 750,000	12c
" 1,800,000	10c
" 6,000,000	9c
Up to 21,000,000	8 1/2c
Over 21,000,000	8c

The city pays the Board a fixed rate of approximately $16,000 per year for its 324 hydrants. Private fire protection, including standpipes and sprinkler systems, is billed at $50.00 per year for each 6-inch connection to the main, the cost of installation being paid by the owner of the property.

Service taps are made at the expense of the property owner, who also bears the expense of excavating and repairing the street, the size of the service regulating the cost.

New Bedford, Mass.—112,597

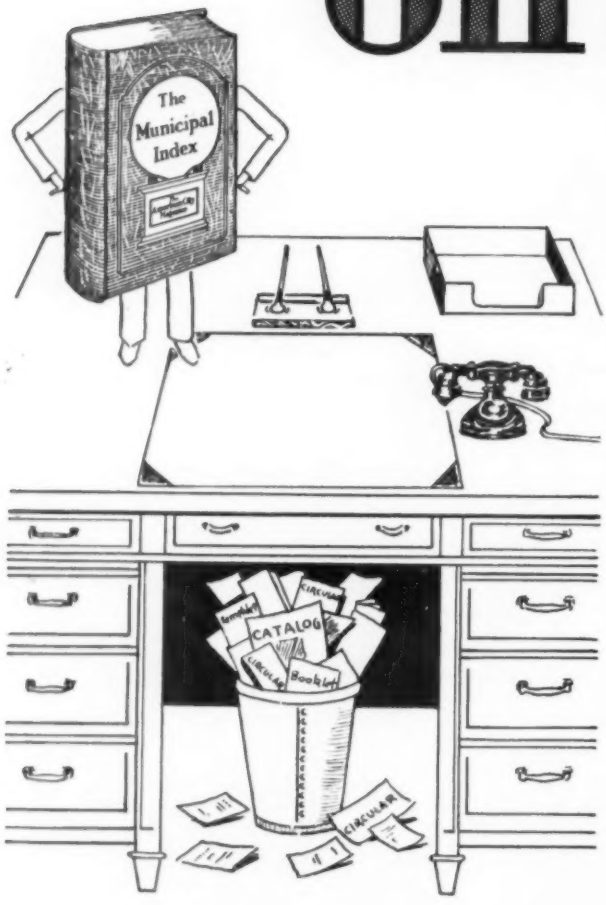
For water supplied from the Quittacas pumping station, the city of New Bedford, Mass., charges the following rates:

Cubic Feet per Quarter	Per 1,000 Cubic Feet
First 10,000	$1.12 1/2
Next 90,000	1 00
" 900,000	0 75
" 1,000,000	0 40
Over 2,000,000	0 10

The minimum charge of $5.00 per year allows 4,444 cubic feet of water.

The annual rental charges for meters supplied by the city and installed within basement walls of the house are $1.50 for a 5/8-inch meter, $2.00 for a 3/4-inch meter, and $3.25 for a 1-inch meter.

On 16,000 officials' desks!



City, Town, County and Water-works Officials everywhere tell us they find practically everything they need in the way of information on municipal and water-works equipment in this one handy volume.

If you have not already seen a copy of the 1931 Municipal Index, write us.

THE AMERICAN CITY MAGAZINE CORPORATION

Publishers of THE MUNICIPAL INDEX

470 Fourth Avenue New York

Why not remember to mention THE AMERICAN CITY?

Rentals for larger-size meters will be charged proportionate to the cost of the meter and its installation.

No charge is made for hydrant rental or for private fire service. In the case of private fire service the entire cost of installation and maintenance is borne by the consumer.

The installation charges for services from the main to the street line, are as follows:

Size of Service	Charge
5/8"	$31.00
3/4"	32.00
1"	39.00

In cases where permanent pavement is disturbed, the owner is also required to pay for replacing it.

For secondary services, temporary services or for services larger than 1-inch in size, the entire cost of installation, including the cost of resurfacing the permanent street pavement, is billed. For all services carried inside private property, the owner must pay the entire cost of such work.

Battle Creek, Mich.—43,573

The Department of Public Works of Battle Creek, Mich., makes the following charges for water:

Gallons per Day	Per 1,000 Gallons Inside City	Per 1,000 Gallons Outside City
Up to 500	16c	24c
500 to 1,000	15c	23c
1,000 to 5,000	14c	21c
5,000 to 10,000	13c	20c
10,000 to 30,000	12c	18c
30,000 to 70,000	11c	17c
70,000 to 100,000	10c	15c
100,000 to 150,000	9c	14c
150,000 to 400,000	8c	12c
Over 400,000	Special rate	

The minimum water rate is 50 cents per month.

The city receives no revenue from hydrants located within the city limits. For hydrants outside the city limits the charge is $80.00 per year.

The city formerly charged for sprinkler fire service according to the size of the pipe, but strong opposition was made to the charge by several manufacturing firms, and the charge was removed. The Commission also removed the requirement for the installation of a meter on a fire service for a building within the city limits, but required a meter where the building is located outside the city limits.

Accessible stop and waste cocks or valve and bleeder are required on main water-supply lines just inside the foundation wall of a building, and a suitable valve must be provided for each group of fixtures in different parts of the building.

Dearborn, Mich.—50,358

Water rates for the city of Dearborn, Mich., consumers are as follows:

Cubic Feet per Quarter	Per 1,000 Cubic Feet
First 1,000 or less	$1.75 minimum
1,001 to 10,000	$0.95
10,001 to 10,000,000	0.80
Over 10,000,000	0.65
4" to 8" fire line services per quarter	25.00

Rates to consumers outside the city limits are 60 per cent higher than the above city rates.

No hydrant rentals are charged, and private fire services, including sprinklers, are metered and charged for at metered rates.

Dearborn installs water services from the main to the property line and sets the stopbox upon written application of a master plumber licensed in the city. All 5/8- 3/4- and 1-inch meters are furnished by the city without charge.

Detroit, Mich.—1,568,662

Meter Service Charge
Payable Quarterly

Size of Meter	Per Year
5/8"	$2.40
3/4"	3.60
1"	7.20
1 1/2"	14.40
2"	24.00
3"	33.60
4"	43.20
6"	72.00
8"	110.40
10"	158.40
12"	187.20
16"	302.40
24"	532.80

Cubic Feet per Quarter	Per 1,000 Cubic Feet
0 to 10,000	65c
10,000 to 100,000	50c
100,000 and over	40c

Minimum charge, $1.25 per quarter.

For fire line sprinkler service the Department of Water Supply makes the following yearly charge:

Size of Service	Charge
2"	$8.00
3"	11.00
4"	14.00
6"	24.00
8"	36.00
10"	52.00
12"	62.00
16"	100.00

This charge is in addition to the water used which is billed at the regular meter rates. The city makes no hydrant rental charge.

The following prices are charged for installing service connections, based on excavations in mud streets:

Size of Connection	0 to 69 Feet	70 to 89 Feet	90 to 109 Feet	110 Feet and Over
3/4"	$40.00	$45.00	$55.00	$60.00
1"	45.00	50.00	60.00	70.00
1 1/2"	70.00	80.00	90.00	100.00
2"	90.00	100.00	115.00	130.00
3" S. & V.	140.00	150.00	165.00	180.00
4" S. & V.	150.00	160.00	175.00	190.00
6" S. & V.	190.00	200.00	225.00	240.00

All connections in streets where a service main is laid on each side of the street will be installed at cost plus 20 per cent with a deposit of $25.00 for a 3/4-inch connection, $30.00 for 1-inch, $45.00 for 1 1/2-inch and $55.00 for 2-inch. For cuts in first-year asphalt streets there will be a charge of $55.00, in second-year streets a charge of $40.00, and in streets where pavement is over two years old, a charge of $20.00. All taps on mains 24 inches or larger in size and in streets 110 feet or wider will be made on a cost plus 20 per cent basis.

Installation of service pipes from main to lot line shall consist of tapping the main, inserting the corporation cock with proper couplings, laying pipe from main to lot line, and providing a stop with an approved type of stop box and cover marked "Water."

Flint, Mich.—156,492

In Flint, Mich., all bills in excess of $10.00 per month are billed monthly and those under $10.00 are billed quarterly, the rates being as follows:

Cubic Feet per Month	Per 100 Cubic Feet
First 3,500	15c
Next 3,500	11c
Over 7,000	8c

Minimum Charges

Size of Meter	Charge per Month
5/8"	$0.75
1"	1.12
1 1/2"	1.87
2"	2.62
3"	9.18
4"	16.30
6"	36.37
8"	70.12

Quarterly minimum charges are three times the above, except for services with 5/8-inch meter and using 900 cubic feet per quarter or less, for which the minimum is $2.00 per quarter. Rates outside of the city limits are 50 per cent higher than city rates.

No revenue is received for fire protection purposes, neither from hydrant rentals nor private fire connections.

The consumer pays the complete cost of service line installations from mains to meters, lead pipe being used from the main to the curb line, and either lead or genuine wrought iron from the curb to the building, on sizes from 3/4 to 1 1/2 inches. Services 2 inches and larger are made entirely of cast iron. While the owner pays for the installation, city employees actually install and inspect the pipe, to protect the city from leakage or hidden unmetered connections.

Hamtramck, Mich.—56,268

Cubic Feet per Quarter	Per 1,000 Cubic Feet
0 to 5,000	95c
5,000 to 10,000	90c
Over 10,000	80c

Minimum charge, $2.15 per quarter.

Service Charge

Size of Meter	Per Quarter
5/8"	$1.20
3/4"	1.80
1"	3.60
1 1/2"	7.20
2"	12.00
4"	21.60
6"	36.00
8"	55.20
10"	79.20
12"	93.60
16"	151.20
24"	266.40

Tap service charges range from $5 for a 3/4-inch tap and $6.00 for a 1-inch tap to $236.00 for a 24 x 12-inch tap.

Marquette, Mich.—14,789

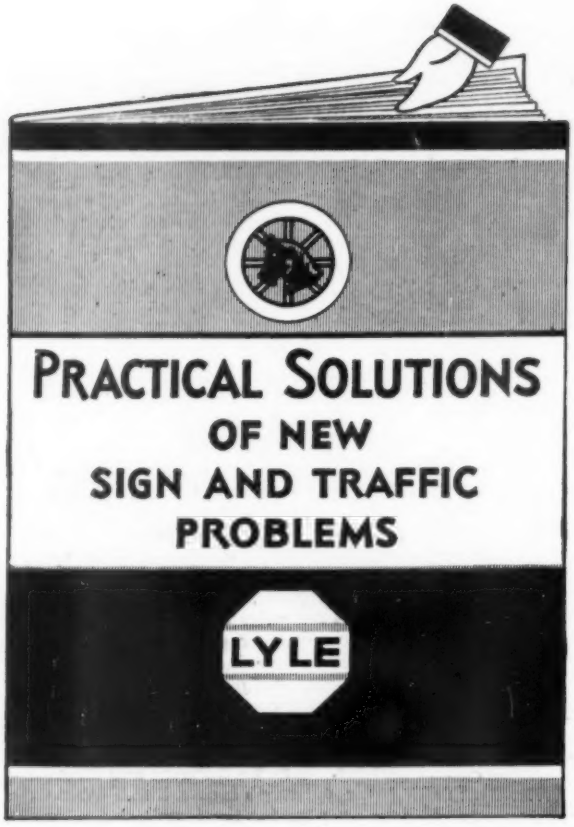
Cubic Feet per Quarter	Per 100 Cubic Feet
First 7,000	10c
Next 7,000	7c
" 7,000	5c
Over 21,000	3c

Service and Meter Charge

Size of Meter	Per Quarter
5/8"	$1.35
3/4"	1.80
1"	3.00
1 1/4"	3.75
1 1/2"	4.50
2"	6.00
3"	12.00
4"	24.00
6"	36.00
8"	60.00

Hydrant charges are $25.00 each per year. No charge is made for private fire service.

(To be continued in the October issue)



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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

Municipal Utilities

The Administration of Municipally Owned Utilities.—By Delos F. Wilcox, Ph. D. Municipal Administration Service, 261 Broadway, New York. 1931. 80 *pp.* 50c.

The Municipal Administration Service, aided by the Haynes Foundation of Los Angeles, has done a signal service in publishing this comprehensive, compact outline, representing the groundwork of a treatise that Dr. Wilcox had under way at the time of his death in 1928, and that might have been the crowning achievement of his keen intellect, wide experience and able pen. It deals with municipal utility matters from a neglected angle, taking municipal ownership and operation as the established facts that they are and proceeding to analyze and describe the technique of acquisition, financing and administration generally, and the relation of utilities to other municipal functions. This is no mere skeleton, though but sparely and irregularly rounded out; it contains the breath of life, instilled into it by the virile personality of the author. Its conciseness may well be an advantage in giving it the wide field of usefulness it deserves.

Prisons and Prisoners

Taming the Criminal.—By John Lewis Gillin, Ph. D. The Macmillan Company. 1931. 318 *pp.* $3.50 *from* THE AMERICAN CITY.

Dr. Gillin, a professor of sociology at the University of Wisconsin, has worked assiduously for many years towards better and more humane prison conditions in this country. His present work, subtitled "Adventures in Penology," is the result of a year's quest in many parts of the world for fresh approaches to the old problem. His inquiry, made possible by the Social Science Research Council of the United States, took him to Japan, the Philippine Islands, Ceylon, India, Switzerland, Belgium, and England, and, for purposes of comparison, included some of our own Southern States. "He was astonished at two conditions which revealed themselves as he traveled and studied," says the preface: "(1) how, the world round, the prison systems have been influenced by English and American precedents, and (2) how many adventures have actually been made by other people on the basis of the old models."

The greatest value is given to his record of these and other conditions by the method of presentation. The system of each country is reported upon separately in a readable and informative style. Its distinguishing features are discussed comparatively with those at home. Especial attention is given to precedent for improvement, here or there. The section for each country has its own bibliography. The different types of prison farm organization of Alabama, Mississippi, and Florida are described in detail, compared and evaluated, and certain suggestions which they offer for northern states noted.

Interstate Power

Interstate Transmission of Electric Power.—By Hugh Langdon Elsbree, Instructor in Government, Harvard University. Harvard University Press, Cambridge, Mass. 1931. 212 *pp.* $2.50.

A study in the conflict of state and Federal jurisdiction with respect to this increasingly important public-utility problem, taking up both the prohibition of interstate transmission and the regulation of rates, security issues and other matters where such transmission is permitted.

Fire Insurance Grading

The League of Minnesota Municipalities, under date of June 15, 1931, has issued publication No. 32, entitled "Grading Municipalities to Determine Fire Insurance Rates." It contains an explanation of the determination of fire insurance rates in Minnesota and a table showing for each municipality its fire insurance district and class, with classification as to water supply, fire departments, fire alarm, relevant ordinances and structural conditions. 116 pp. (Apply to the League of Minnesota Municipalities, University of Minnesota, Minneapolis.)

Civic Progress

The American Civic Annual, 1931. With a List of Who's Who in Civic Achievement.—Edited by Harlean James, Executive Secretary, American Civic Association. With an Introduction by Frederic A. Delano, President. 356 *pp.* $3.00 *from* THE AMERICAN CITY.

"Necessarily, by its character, *The American Civic Annual* records the 'Civic Achievements' which have culminated or reached a desirable stage of development during the preceding year. But . . . these annual achievements piece together into the history of a generation." This is a descriptive phrase from an incidental editorial note in the latest (and largest) of the volumes. It gives instant perspective and an added significance to the individual articles. In keeping with established policy, a new range of topics is featured this year. Particular attention is given, on the one hand, to the country's treasures of unspoiled beauty in national and state parks and other reservations, and, on the other hand, to the necessity of more intelligent planning for our cities and regions as places of human habitation.

The *Who's Who in Civic Achievement* is a notable record, 53 pages long. One of its remarkable features is its revelation of the extent to which the furtherers of the civic well-being of the country are persons also actively engaged in other pursuits.

The more than 80 individual articles are presented in closely integrated groupings to cover progress in the nation, regional progress, progress in the states, and in cities and towns. The 30 authors who have reported upon city and regional affairs make up no mean who's who in the field of present planning. Roadside Improvement (in the section, "In the States") is covered in a broad and comprehensive manner, and includes, in addition to numerous other articles, a symposium on Landscape Design in State Highways, and one on recent billboard legislation.

A Taxless City

A description of the municipal electric light and power plant of Ponca City, Okla., and an account of its financial success, which has been such that its earnings have been sufficient to meet all current city expenses. 16 pp. (Apply to Burns & McDonnell, Engineering Co., 406 Interstate Bldg., Kansas City, Mo.)

Water and Sewage Treatment

Seven reprints on various aspects of water supply and sewage disposal have recently appeared, two of them in English and the remainder in German, as follows: by Karl Imhoff, Chief Engineer, Ruhrverband, Essen, Germany, "Impounding Reservoirs as a Substitute for Biological Sewage Treatment Works in the Ruhr District," 5 pp.; "Observations on Scum in the Imhoff Tanks of the Ruhr District," 6 pp. (these are translated by Gordon M. Fair, Associate Professor of Sanitary Engineering, Harvard University); also "Die Stauseen im Ruhrtale," 14 pp., and "Die Wasserwirtschaft des niederrheinischwestfälischen Industriegebiets 1929-1930," 4 pp.; by Dr. F. Sierp, Ruhrverband, "Heizrohre für Schlammfaulräume," 12 pp.; and "Einfluss der Schlammumwälzung im Faulraum auf die Gasmenge, die nötige Raumgrösse und die Schwimmdecke," 7 pp.; by Dr. Mahr, Engineer, Ruhrverband, "Uber Teilfüllung bei Kreisrohren."

Municipal Directory

The 49th Annual Issue of "The Empire Municipal Directory and Year Book" for 1931-1932 contains a directory of local authorities and their officials in England and Wales, Scotland, Ireland, and the Overseas Dominions, as well as sections on Road Construction and Maintenance; Lighting, Heating and Ventilation; Water Supply, Purification and Softening; Sewerage and Sewage Disposal; Public Cleansing and Waste Utilization; Fire Prevention; Housing and Town Planning; Labor-Aiding Plant and Appliances; Public Recreation Grounds; Municipal and Public Health Law; and Municipal Engineering, Public Health and Scientific Societies. 418 pp. 12s. 6d. net. (Apply to the Sanitary Publishing Co., Ltd., 8, Breams Building, E.C. 4, London, England.)

Municipal Leagues

The "Proceedings Seventh Meeting" of the American Municipal Association reports the convention held in Cleveland in November, 1930, at which methods of organizing and administering state organization of cities were discussed. Among the papers included is a 24-page summary of "The Municipal League Movement" by Dr. Harvey Walker, Assistant Professor of Political Science at Ohio State University and Secretary-Treasurer of the Ohio Municipal League. 144 pp. $6.00 prepaid. (Apply to the Association, Lawrence, Kans.)

Drinking Fountains

The Women's Bureau of the U. S. Department of Labor has published a bulletin (No. 87) on "Sanitary Drinking Facilities, with Special Reference to Drinking Fountains," by Marie Correll, for two purposes: "First, to help employers to select fountains of sanitary design by making available to them the best standards that have been formulated, and second, to call attention to the dangers to health that exist in insanitary drinking facilities." A table is included showing the extent of legislation in the various states on the subject of drinking facilities. 28 pp. 10c. (Apply to the Superintendent of Documents, Washington, D. C.)

Tax Billing

"Procedure for the Billing, Collection and Settlement of Taxes for Hamilton County, Ohio," is the subject of Report No. 30 of the Cincinnati Bureau of Governmental Research. The recommendations embodied in the report represent the result of a study conducted over a period of two years, during which time a new state constitutional amendment was adopted to provide for a more flexible system of taxation. It has been found that the new laws necessitate only slight modifications in the procedure suggested in the report for billing real estate. Various forms are reproduced in the appendix. 50 pp. mimeographed. (Apply to the Bureau, 914 Main St., Cincinnati, Ohio.)

Fire Fighting

The report of the proceedings of the 43d annual convention of the Illinois Firemen's Association, held at Peoria, September 9-11, 1930, is a paper-bound booklet of 224 pages and contains a number of addresses on such matters as institutional fire protection, first-aid work, fire pumps, ladder work and inspections, as well as lists of fire chiefs and salaries, department strength and expenses, equipment, and fire losses, with an analysis of causes of fires. The report suffers from lack of an index. (Apply to the Secretary, Assistant Chief Roy W. Alsip, Champaign, Ill.)

Police School

The League of Kansas Municipalities conducted a police school at Wichita from June 1 to 6, inclusive, with instruction given by a faculty of seventeen, and covering a wide range of subjects. Outlines of the lectures are given in a 200-page mimeographed book, available for $3 in paper and $4 in imitation leather. (Apply to the League, Lawrence, Kans.)

Auto Thefts

A tabulation showing the "Number of Auto Thefts Reported in 83 Cities of the United States Having a Population of Over 100,000, for the Twelve Months Period Ending December 31, 1930," has been compiled by Frederick Rex, Librarian of the Municipal Reference Library in Chicago, from monthly reports made by the cities to the Bureau of Investigation of the U. S. Department of Justice and published in "Uniform Crime Reports" for December, 1930. Toledo, Ohio, heads the list with the highest ratio of thefts for each 10,000 population. Unfortunately, no reports were received from New York City or Pittsburgh, Pa. 2 mimeographed pp. 2c. (Apply to the Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

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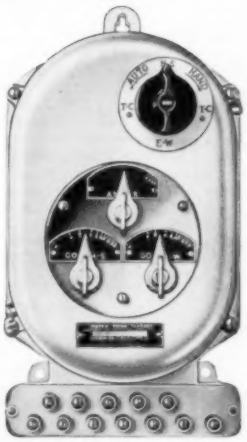

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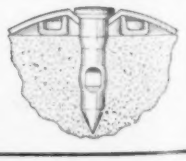

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Police

An outspoken document is the "Report on Police," No. 14 of the publications of the National Commission on Law Observance and Enforcement. The report was prepared by David G. Monroe and Earle W. Garrett, Research Assistants in the Department of Political Science, University of Chicago, under the direction of August Vollmer, Professor of Police Administration at the University. The purpose of the report was "to present . . . . the principal causes of the defects in police administration which too generally leave the citizen helpless in the hands of the criminal class." Cities are referred to by name throughout. Chapters discuss the executive; personnel selection and training; communication and equipment; records; crime prevention; police service and the state. Criticisms are made and suggestions offered. 140 pp. 30c. (Apply to the Superintendent of Documents, Washington, D. C.)

Elevators

The second revision of the "American Standard Safety Code for Elevators, Dumbwaiters and Escalators—Rules for Construction, Inspection, Maintenance, and Operation," dated July, 1931, has been approved by the American Standards Association. Changes in the Code, which eliminates all speed limits on passenger elevators and allows two-story cars and the operation of more than one elevator in a single shaft, were made only after extensive research by the United States Bureau of Standards, under the auspices of a committee representing the organizations sponsoring the revision. The Code is intended as a guide to state and municipal authorities in the drafting of their regulations, and also for use as a standard reference work. 173 pp. $1.00. (Apply to the American Standards Association, 29 W. 39th St., New York.)

Municipal Administration

In November, 1922, THE AMERICAN CITY published an article by Lent D. Upson, "Research and the Increased Activities of City Government." This was based upon a study of the growth of municipal responsibility and municipal services in Detroit. Now, after the lapse of almost a decade, a revision of that earlier study is available in the form of a 24-page publication entitled "The Growth of a City Government: An Enumeration of Detroit's Municipal Activities." (Apply to Detroit Bureau of Governmental Research, 51 Warren Ave., W., Detroit, Mich.)

Building and Housing

A comprehensive, well-organized, and up-to-date "Bibliography on Building and Housing" is issued in the form of a 14-page bulletin dated May 1, 1931, available from the Civic Development Department, Chamber of Commerce of the United States, Washington, D. C.

Public Works Records

The second demonstration installation of the Committee on Uniform Street Sanitation Records of the International Association of Public Works Officials is described in a report entitled "Manual of Street Sanitation Records, Including Other Public Works Activities for Cities of 25,000 to 500,000 Population, as installed in Kenosha, Wis." The first installation was made in Brunswick, Ga., a city of 15,000 inhabitants. The manual relates "how a model records and cost accounting system for the public works department operates in Kenosha and makes possible the measuring of work performed, the setting up of unit cost standards for each public works operation, and the preparation of the work program and budget." The forms and methods may be installed by most cities of up to 500,000 population. 81 pp. mimeographed, including a number of forms. (Apply to the Committee, 923 E. 60th St., Chicago, Ill.)

Swimming Pools

An analysis of information regarding construction, operation and maintenance of 221 outdoor pools is contained in an article on "Municipal Outdoor Swimming Pools," by Roger J. Bounds, of the Civic Development Department of the Chamber of Commerce of the United States, which has been reprinted from The Municipal Index, 1931, for the Chamber of Commerce of the United States. 16 pp. 25c. (Apply to THE AMERICAN CITY, 470 Fourth Ave., New York.)

Building and Plumbing Codes

To make available the methods, progress and experience of American municipalities in building-code revision, the Building Code Committee of the Department of Commerce has prepared a 1931 "Building Code and Plumbing Code Tabulation" (LC 306), based on answers to questionnaires sent out during April and May, 1931, to cities, boroughs, villages and towns having a population of 5,000 or over. The information tabulated includes the date of the building code and of the plumbing code, whether or not they are being revised, and if so, the estimated dates of completion; and the principal changes made or being made in the building code. 42 pp. mimeographed. (Apply to the Bureau of Standards, Department of Commerce, Washington, D. C.)

Radburn

In a 4-page folder, quarto size, two illustrated articles on "Radburn—The Challenge of a New Town," by Tracy B. Augur, City Planning and Landscape Architect, Detroit, Mich., have been reprinted for the City Housing Corporation from the *Michigan Municipal Review* for February and March, 1931. (Apply to the Corporation, 18 E. 48th St., New York.)

City Plans

"A Plan for the City of Vancouver, British Columbia—1930" is a tremendous tome of 388 quarto pages, which reprints the 1928 Report, brought up to date, and includes a report on the Town Plan of the South Vancouver Area. There are many illustrations and maps. The 132-page "Comprehensive City Plan of Jacksonville, Fla.," which has been adopted, was prepared by George W. Simons, Jr., Consulting Municipal Engineer, of Jacksonville; it contains a number of small illustrations and a series of maps. For the Vancouver Plan ($2.50), apply to the Town Planning Commission, Vancouver, B. C. For the Jacksonville Plan, apply to the City Commission, Jacksonville, Fla.

Sewage Disposal

The Division of Municipal and Industrial Research of the Massachusetts Institute of Technology has summarized the "Principles of Sewage Disposal" in an 8-page bulletin (No. 12), prepared with the cooperation of the Department of Biology and Public Health of the Institute. A brief descriptive outline of sewage disposal processes is included. 10c. (Apply to the Division of Municipal and Industrial Research, Massachusetts Institute of Technology, Cambridge, Mass.)

Highway Engineering

The reports of the conferences of three highway engineering organizations are now available. The 339-page cloth-bound "Proceedings of the Sixth Congress of the Permanent International Association of Road Congresses" records the deliberations of the Association at its meetings held in Washington, D. C., in October, 1930, at which 1,000 delegates were present. (Apply to the American Organizing Commission, Permanent International Association, 1723 N St., N.W., Washington, D. C.) The Highway Research Board held its tenth annual meeting in Washington in December, 1930. The "Proceedings," edited by Roy W. Crum, Director of the Highway Research Board, are published in a 420-page illustrated volume, obtainable for $2.00 from the National Research Council, Constitution Ave. and 21st St., Washington, D. C. The University of Michigan publishes the "Proceedings of the Seventeenth Annual Conference on Highway Engineering," held at the University in February, 1931. 221 pp. (Apply to the University, Ann Arbor, Mich.)

Model Ordinances

To supplement a study made last year on "Municipal Licenses for Hawkers and Peddlers and Transient Merchants," by W. Rolland Maddox, the Michigan Municipal League has prepared ordinance drafts which it believes will be of value in assisting municipalities to adopt ordinances of like character. The ordinances can be adapted to fit local conditions. The drafts are issued as Information Bulletins of the League, under date of July, 1931. No. 5 is entitled "Suggested Peddlers' License Ordinances, and comprises 31 mimeographed pages. No. 6, "Suggested Transient Merchants' License Ordinance," consists of 17 mimeographed pages. The price of each is $1.00. (Apply to the League, Ann Arbor, Mich.)

Unemployment Problems

The aim of the report on "Unemployment Problems in the United States," by H. B. Butler, Deputy-Director of the International Labor Office, is "to give a general idea of the nature and extent of the unemployment problem in the United States, which may serve as an introduction to those who are unfamiliar with American conditions." Chapters are devoted to Extent of Unemployment; Decline of Consumption; Machinery and Employment; Some Aspects of Technological Unemployment; Remedial Measures; and Regularization of Employment. The conclusion is reached that "unemployment is not a disease mainly curable by industry itself, nor even a disease which can be certainly prevented by any amount of national organization of forethought. Its most malignant form is in the last analysis traceable to deep-seated causes of an international character." 112 pp. 60c, paper bound; $1.50, cloth bound. (Apply to the World Peace Foundation, 40 Mount Vernon St., Boston, Mass.)

Tax Problems

Special report No. 3 of the New York State Tax Commission is entitled "Full Value Real Estate Assessment as a Prerequisite to State Aid in New York," and is by Chester Baldwin Pond, Ph. D., New York State Fellow in Taxation at Cornell University and Research Investigator, New York State Tax Commission. It is a booklet of 189 pages, containing a thorough study of the problem of uniform property assessments and of conditioned state and federal aid for various purposes and in various states and countries, with a discussion of the probable operation of a provision requiring full value assessments and the possibility of legalizing such a provision.

The annual report of the New York State Tax Commission for 1929, published this year, contains, as usual, a wealth of information on valuations and taxes in the various subdivisions of New York State, with a discussion involving taxation. 412 pp. (Apply to State Tax Commission, Albany, N. Y.)

Ontario Hydro

The 23d annual report of the Hydro-Electric Power Commission of Ontario for the year ending October 31, 1931, is the usual substantial document, presenting not only much statistical matter but a descriptive account of the status of the Commission's activities and progress during the year in question, with many illustrations. 495 pages and map. (Apply to the Commission, Toronto, Ont.)

Ordinances

A pamphlet containing "City Ordinances Relating to the Mercantile Industry of East Liverpool, Ohio," has been published by the Retail Merchants' Division of the Chamber of Commerce of East Liverpool. Also included is a Board of Health order banning the return of certain types of wearing apparel. 4 pp. (Apply to H. S. Barth, Secretary, Chamber of Commerce, East Liverpool, Ohio.)

Housing

"Housing, 1928-30" is the title of a recent report supplementing former accounts of the London County Council activities in this field. 148 pp., elaborately illustrated. 2s., 6d. (Apply to London County Council, London, England.)

Other Reports Received

BUFFALO, N. Y.—Annual Report, Department of Health. 1930. 67 pp.

LOWELL, MASS.—Final Report of the Finance Commission. June 30, 1931. 28 pp.

NEW YORK, N. Y.—Report, Chief Engineer, Board of Estimate and Apportionment. 1929. 340 pp.

ST. PAUL, MINN.—Civil Service. 1930. 19 pp.

SYDNEY, NEW SOUTH WALES, AUSTRALIA.—Annual Report, City Engineering and Building Surveyor's Department. 1930. 66 pp., and graphs.

WALLINGFORD, CONN.—Report, Wallingford Electric Works. 1930. 75 pp.

WARWICK, R. I.—Annual Report, Warwick Water Supply Board and the Board of Water Commissioners. Year ending April 30, 1931. 34 pp.

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CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance, other than local.)

SEPTEMBER 9-11.—PORT HURON, MICH. (350)
Michigan Municipal League. Annual meeting. Director, Harold D. Smith, University of Michigan, Ann Arbor, Mich.

SEPTEMBER 10-12.—VERNON, B. C. (100)
Union of Canadian Municipalities. Annual convention. Secretary, Samuel Baker, City Clerk, London, Ont.

SEPTEMBER 14-17.—MONTREAL, QUE. (800)
American Public Health Association. Annual meeting. Acting Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

SEPTEMBER 15-18.—NEW WESTMINSTER, B. C. (300)
Union of British Columbia Municipalities. Annual convention. Secretary, A. W. Gray, P. O. Box 580, New Westminster, B. C.

SEPTEMBER 16-18.—HUNTINGTON, IND. (100)
Municipal League of Indiana. Annual convention. Executive Secretary, Frank G. Bates, Indiana University, Bloomington, Ind.

SEPTEMBER 21-24.—KANSAS CITY, MO. (450)
Association of American Cemetery Superintendents. Annual convention. Secretary, William B. Jones, Superintendent of Highwood Cemetery, Pittsburgh, Pa.

SEPTEMBER 21-24.—MONTEREY, CALIF. (1,500)
California Conference on City Planning. League of California Municipalities. Joint meeting. C. J. S. Williamson, Secretary of the Conference, Chamber of Commerce Building, Los Angeles, Calif.; William J. Locke, Secretary of the League, 1095 Market Street, San Francisco, Calif.

SEPTEMBER 22-23.—LUCERNE, QUE. (350)
Canadian Good Roads Association. Annual convention. Secretary-Treasurer, George A. McNamee, New Birks Building, Montreal, Que.

SEPTEMBER 24-26.—NEW YORK. (150)
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

SEPTEMBER 25-26.—PROVO, UTAH. (350)
Utah State Municipal League. Annual convention. Secretary-Treasurer, P. K. Nielsen, Price, Utah.

SEPTEMBER 26-OCTOBER 2.—ATLANTIC CITY, N. J.
American Electric Railway Association. Golden Anniversary convention. General Secretary, Guy C. Hecker, 292 Madison Avenue, New York.

SEPTEMBER 28-OCTOBER 1.—PHILADELPHIA, PA. (200)
American Association of Port Authorities. Annual convention. Secretary, Tiley S. McChesney, Whitney Bank Building, New Orleans, La.

SEPTEMBER 28-OCTOBER 1.—SALT LAKE CITY, UTAH. (400)
American Association of State Highway Officials. Annual convention. Executive Secretary, W. C. Markham, 1222 National Press Building, Washington, D. C.

SEPTEMBER 28, WEEK OF.—TORONTO, ONT.
American Institute of Park Executives and the American Park Society. American Association of Zoological Parks and Aquariums. Joint meeting. William H. Walker, Executive Secretary of the Institute, 224 Wakewa Avenue, South Bend, Ind.; Will O. Doolittle, Secretary of the Association, Box 422, Tulsa, Okla.

SEPTEMBER 28-OCTOBER 1.—LOS ANGELES, CALIF.
The Public Ownership League of America. Annual conference. Secretary, Carl D. Thompson, 127 North Dearborn Street, Chicago, Ill.

SEPTEMBER 29-OCTOBER 2.—BOSTON, MASS.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

OCTOBER 5-8.—DETROIT, MICH., AND ENVIRONS. (50)
American Civic Association, Inc. Fifth Annual Traveling Meeting. Executive Secretary, Miss Harlean James, Union Trust Building, Washington, D. C.

OCTOBER 5-9.—TORONTO, ONT. (600)
National Recreation Association. Annual Recreation Congress. Secretary of the Congress, Thomas E. Rivers, 315 Fourth Avenue, New York.

OCTOBER 7-9.—ST. PAUL, MINN. (700)
American Society of Civil Engineers. Fall meeting. Secretary, George T. Seabury, 33 West 39th Street, New York.

OCTOBER 7-10.—LOUISVILLE, KY. (250)
International City Managers' Association. Annual convention. Executive Secretary, Clarence E. Ridley, 923 East 60th Street, Chicago, Ill.

OCTOBER 7-8.—LOWELL, MASS.
Massachusetts Federation of Planning Boards. Annual conference. Secretary, Loring H. Jacobs, 135 Benvenue Street, Wellesley, Mass.

OCTOBER 7-9.—MILWAUKEE, WIS. (200)
Wisconsin Chiefs of Police Association. Annual meeting. Secretary, R. H. McCarty, Police Department, Kaukauna, Wis.

OCTOBER 8-9.—CINCINNATI, OHIO.
American Water Works Association—Central States Section. Annual convention. Secretary, B. J. Lechner, Water Department, Erie, Pa.

OCTOBER 8-9.—CAMDEN, N. J. (500)
New Jersey State League of Municipalities. Annual convention. Executive Secretary, Sedley H. Phinney, 34 West State Street, Trenton, N. J.

OCTOBER 12-13.—MONTEREY, CALIF. (150)
California Sewage Works Association. Annual convention. Secretary, Professor E. Reinke, Life Sciences Building, University of California, Berkeley, Calif.

OCTOBER 12-15.—ST. PETERSBURG, FLA. (400)
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

OCTOBER 12, WEEK OF.—CHICAGO, ILL. (7,000)
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 12-16.—ATLANTA, GA. (450)
National Tax Association. Annual conference. Secretary, W. G. Guery, Chairman of the South Carolina Tax Commission, Columbia, S. C.

OCTOBER 12-13.—DEVILS LAKE, N. DAK. (100)
League of North Dakota Municipalities. Annual meeting. Executive Secretary, Myron H. Atkinson, Bismarck, N. Dak.

OCTOBER 13-16.—PITTSBURGH, PA. (500)
Illuminating Engineering Society. Annual convention. General Secretary, E. H. Hobbie, 29 West 39th Street, New York.

OCTOBER 13-14.—AKRON, OHIO. (400)
Ohio Conference on Sewage Treatment. Annual convention. Secretary-Treasurer, G. E. Flower, Superintendent of the Southerly Sewage Plant, Cleveland, Ohio.

OCTOBER 14-17.—HAVANA, CUBA. (1,200)
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Fire Chief, Yonkers, N. Y.

OCTOBER 14-15.—JOPLIN, MO. (150)
League of Missouri Municipalities. Annual convention. Executive Secretary, J. W. Lumpp, 6801 Delmar Boulevard, University City, Mo.

OCTOBER 14-15.—FREMONT, NEBR. (400)
League of Nebraska Municipalities. Annual meeting. Secretary-Treasurer, C. E. Beals, 407 East 12th Street, Crete, Nebr.

OCTOBER 15.—CHICAGO, ILL.
Institute of Traffic Engineers. Annual meeting. Secretary-Treasurer, Hawley S. Simpson, 175 Fifth Avenue, New York.

OCTOBER 15-16.—ONTARIO, ONT. (125)
Ontario Associated Boards of Trade and Chambers of Commerce. Annual meeting. Secretary-Treasurer, T. Marshall, Royal Bank Building, Toronto, Ont.

OCTOBER 18-21.—TOLEDO, OHIO. (325)
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, Gerrish Gassaway, Chamber of Commerce, Wilmington, Del.

OCTOBER 19-23.—PITTSBURGH, PA. (200)
American Society of Municipal Engineers. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

OCTOBER 19-21.—MCPHERSON, KANS. (300)
League of Kansas Municipalities. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

OCTOBER 19-22.—NEW ORLEANS, LA. (300)
Southwest Water Works Association. Annual convention. Secretary-Treasurer, Lewis A. Quigley, Fort Worth, Texas.

OCTOBER 20-21.—ITHACA, N. Y. (60)
New York State Sewage Works Association. Fall meeting. Secretary-Treasurer, A. S. Bedell, New York State Department of Health, Albany, N. Y.

OCTOBER 21-23.—DENVER, COLO. (100)
American Water Works Association—Rocky Mountain Section. Annual meeting. Secretary-Treasurer, Dana E. Kepner, 226 Continental Oil Building, Denver, Colo.

OCTOBER 21-22.—NORFOLK, VA. (400)
League of Virginia Municipalities. Annual convention. Executive Secretary, Morton L. Wallerstein, 408 Travelers Building, Richmond, Va.

OCTOBER 22-23.—WAUKEGAN, ILL. (300)
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, Urbana, Ill.

OCTOBER 22-23.—JEFFERSON CITY, MO. (100)
Missouri Water and Sewerage Conference. Secretary-Treasurer, H. M. Bosch, Jefferson City, Mo.

OCTOBER 26-27.—RACINE, WIS. (125)
American Water Works Association—Wisconsin Section. Annual convention. Secretary, L. A. Smith, Superintendent of Water Works, City Hall, Madison, Wis.

OCTOBER 27-30.—JACKSONVILLE, FLA.
International Association of Municipal Electricians. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

OCTOBER 29-31.—LAWRENCE, KANS. (150)
American Water Works Association—Missouri Valley Section. Annual meeting. Secretary, Earl L. Waterman, University of Iowa, Iowa City, Iowa.

OCTOBER 29-31.—EL PASO, TEXAS.
County Judges and Commissioners of Texas. Annual convention. Secretary, W. L. Hilliard, Taft, Texas.

OCTOBER 29-30.—COLUMBUS, OHIO. (50)
Ohio State Planning Conference. Secretary, M. D. Downs, Hamilton County Court House, Cincinnati, Ohio.

OCTOBER 30.—ST. PAUL, MINN. (40)
American Water Works Association—Minnesota Section. Annual meeting. Secretary-Treasurer, Ronald M. Finch, 240 South Fourth Street, Minneapolis, Minn.

OCTOBER 30-31.—VANCOUVER, WASH., AND PORTLAND, ORE.
Washington Association of Commercial Organization Secretaries. Annual meeting. Manager, Thomas B. Hill, Chamber of Commerce, Seattle, Wash.

NOVEMBER 9-11.—BUFFALO, N. Y.
National Conference on Government, a combination of the annual meetings of the following organizations: National Municipal League, Secretary, Russell Forbes, 261 Broadway, New York; *Governmental Research Association,* Secretary, Russell Forbes; *National Association of Civic Secretaries,* Secretary, George H. Hallett, Jr., 311 South Juniper Street, Philadelphia, Pa.; *Proportional Representation League,* Executive Secretary, George H. Hallett; *American Legislators' Association,* Director, Hon. Henry W. Toll, Equitable Building, Denver, Colo.

JANUARY 9-15.—DETROIT, MICH. (25,000)
American Road Builders' Association. Annual convention. Engineer-Director, Charles M. Upham, National Press Building, Washington, D. C.

MAY 2-6.—MEMPHIS, TENN. (1,000)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 20 West 39th Street, New York.

RADIO POLICE SET RECORD IN ARRESTS HERE

Nab 66 More Suspects in May Than Whole Force Seized During April — and Faster

Police officers in radio-equipped cars made, during May, sixty-six more arrests than all the uniformed officers in the department made during April.

April, the month before the radio cars were in use, uniformed men made 559 arrests, of which forty-one were for felonies. In May, the officers manning the forty-three radio cars made 625 arrests, of which 178 were for major crimes.

During April, 177 robberies were reported. In May, with radio cars cruising the streets day and night, robbery figures dropped to 133.

So states the Los Angeles Examiner with regard to the DeForest-equipped Station KGPL of the Los Angeles Police Department, based on the report of Capt. F. T. Hawtrey, in command of the Police Radio Division, covering the first month of operation. Here is the summary for the month of May, 1931:

Messages broadcast	11,796
Runs	9,414
Time on runs	560 hrs. 45 min.
Average time per run	3 min. 34 sec.
Station Calls	882
Teletype and General Calls	960
Arrests	517
Arrest Runs	430
Time on Arrest Runs	21 hrs. 56 min.
Average Time per Arrest Run	3 min. 36 sec

A commendable showing for a police radio alarm system, which may well be repeated in your municipality. May we tell you how?

DE FOREST RADIO COMPANY
Passaic New Jersey

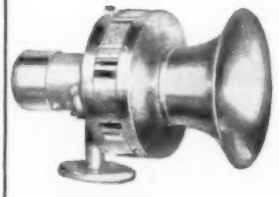
de Forest
POLICE RADIO ALARM SYSTEMS

You put QUALITY above PRICE when you purchase . . .

"AHRENS-FOX"
FIRE-FIGHTING APPARATUS
Recognized as the World's Best

THE AHRENS-FOX FIRE ENGINE COMPANY
CINCINNATI, OHIO, U. S. A.

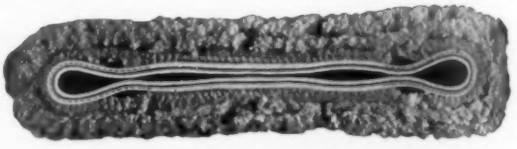
THE NEW FEDERAL "COASTER" SIREN



MORE sound volume to meet modern traffic demands. This siren "clears the way for blocks ahead." Write for Bulletin 36A.

MOST POWERFUL APPARATUS SIREN

FEDERAL ELECTRIC COMPANY
8701 South State Street
CHICAGO ILLINOIS

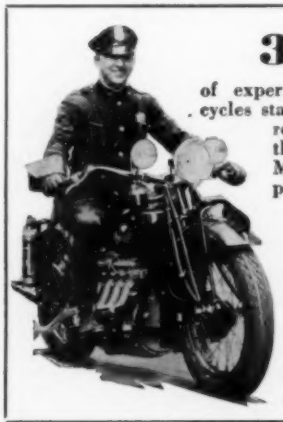


BI-LATERAL FIRE HOSE
is an improved construction

It is always reliable for fire service no matter how old, if the jackets are intact.

The one hose that does not require frequent replacements.

BI-LATERAL FIRE HOSE CO.
20 No. Wacker Drive CHICAGO, ILL.
15 Park Row NEW YORK, N. Y.



30 YEARS

of experience in making good motorcycles stands behind every Indian. This record of success is reflected in the widespread use of Indian Motocycles by Police in every part of the country.

Indian MOTOCYCLES

INDIAN MOTOCYCLE CO.
SPRINGFIELD, MASS.

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

RAWLS MOTOR SICKLE HIGHWAY MOWER

A New Highway Mower

A new motor sickle highway mower, cutting from 8 to 25 miles per hour, has been designed for cutting weeds along highway shoulders. The sickles of this mower, made by the Rawls Manufacturing Co., Streator, Ill., are propelled with twin V-belt drive to a Pitman wheel direct from a 3-horsepower gasoline engine, which eliminates many expensive wearing parts. The sickle speed is instantly and easily changed to any desired speed up to 1,200 r.p.m. by means of convenient throttle control. The frame is of structural steel, reinforced and welded and is mounted on wire wheels with pneumatic tires. The tow hitch is adjustable to different heights.

The 5- or 6-foot cutter bar, which will cut at any angle from straight up to 45 degrees downward, has an automatic spring trip to permit the bar to swing back alongside the unit if an obstruction is met, thus eliminating breakage and dulling of the cutter bar.

The machine, which is drawn by an automobile, truck or tractor, has a cruising speed, while not mowing, up to 50 miles per hour over smooth-surface roads. The cutter bar is driven independently by a variable speed control gasoline engine mounted on the mower, so that the speed at which it operates is not dependent in any way on the speed at which the mower is drawn. Any sickle speed from 100 to 1,200 is instantly obtained.

A.W.W.A. Convention in Memphis

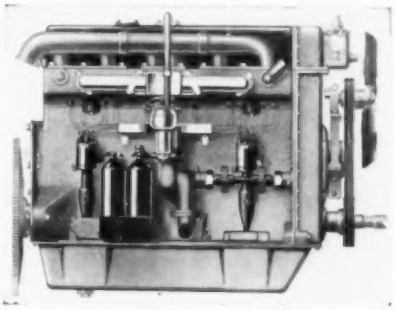
The Board of Directors of the American Water Works Association have decided upon May 2 to 6, 1932, as the date for the next annual convention. It will be held in Memphis, Tenn., with the Hotel Peabody as headquarters.

New Engine Designed for Motor Fire Apparatus

A new engine for fire apparatus, of unusual design and performance, known as the LaFrance V-type 12-cylinder engine, has been announced by the American-LaFrance and Foamite Corporation, Elmira, N. Y. The engine has two banks of six cylinders, having 4-inch bore and 5-inch stroke, and develops 244 hp.

One of the outstanding features of the new engine is its noiseless, smooth-running, vibrationless performance. In addition to the increased number of cylinders, the absence of vibration is attributable to the 30-degree angle of the cylinders, full counterbalancing and stiffness of the crankshaft, lightness and accurate balancing of all reciprocating parts. The small angle of the cylinders reduces the over-all width of the engine, and retains proper water space around the cylinders.

The crankshaft is fully counterweighted and placed in static and running balance. It is made of chrome nickel steel 3½ inches in diameter. As it is extremely short and is mounted in a well-trussed crankcase which is cast integral with the cylinder block, the crankshaft is very rigid.



THE NEW LA FRANCE V-TYPE 12-CYLINDER ENGINE FOR FIRE APPARATUS

The use of aluminum pistons and machined connecting rods, together with lightness of all reciprocating parts, gives this engine fast acceleration covering a wide range of speeds, which means getting to the fire through modern traffic without loss of time.

The engine is of the removable head type, the heads for both sets of cylinders being identical. The complete camshaft and rocker arm assembly is made up in a single unit and is easily removable. The valve mechanism is assembled as a unit and can be easily removed and the valves ground on the bench.

Because of the increased available horsepower, the new LaFrance engine provides greater power capacity for pumping service. There is a 40 per cent power reserve when pumping at the rated capacity of the pump.

A New Retread Mixer

For several years, Adams Multi-Blade road maintainers have been used by highway and street officials and contractors for the mixing of bituminous materials, such as asphalts, tars and road oils, with gravel, stone and slag aggregates on "mixed-in-place" work. J. D. Adams Co., Indianapolis, Ind., now offers a new machine, the Adams Retread Mixer, which is similar to the maintainer, but has several new features especially adapted to this type of work.

The blades of this mixer are 12 inches wide and are set so as to provide sufficient throat room for a 2½- to 3-inch course of material. Three sets of blades, set at a 45-degree angle, zigzag the material, which has been previously covered with bituminous binder, back and forth three times in one trip, thoroughly mixing the bitumen with the aggregate. The long rear blade then evenly spreads material to the required thickness in the same trip.

The mixing blades are rigidly mounted on the main frame, cut in the same plane, and are set to just skim the base so as to pick up and mix all of the material. The rear blade is adjustable 3 inches vertically so as to spread the course to the required depth, and is in three sections which can be adjusted to spread the mix with a slight crown, if desired. All right-hand blades have forward extensions to prevent the mix from spilling out of line. The front and rear ends of the machine are raised and lowered independently by two convenient controls located near the driver's seat.

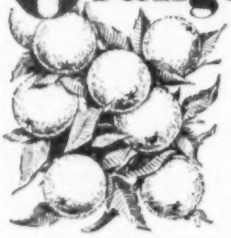
The advantages claimed for this equipment are that it mixes and levels in one operation and produces a smooth riding surface free from waves and irregularities, because of its long wheelbase and rigidly mounted blades.

THE ADAMS RETREAD MIXER HANDLING FROM 2-½ to 3-½ INCHES OF MATERIAL

PAGE FENCE

in 4 Metals

Oranges won't grow in MAINE



Atmospheric conditions are against the raising of this splendid fruit so far north.

It's the same way with fencing.

Corrosive elements in the atmosphere vary in different parts of the country. A good fence in one locality may be foolish extravagance in another, because of the changed corrosive conditions it has to withstand.

To make PAGE Fence last longer and give the best service per dollar invested, it is now available in these four fine metals—each the best for certain atmospheric conditions:

1. **PAGE ALCOA ALUMINUM**
2. **PAGE ARMCO INGOT IRON**
3. **PAGE COPPER-BEARING STEEL**
4. **PAGE ORNAMENTAL WROUGHT IRON**

76 Service Plants erect PAGE Fence everywhere. Write for name and address of plant nearest you. They will gladly consult with you and offer suggestions from plans to erection. Also, send for new illustrated booklet—Border Patrol—which contains complete information and shows various styles. No obligation. Address Page Fence Association, 520 N. Michigan Ave., Dept. E37, Chicago, Illinois.

America's first wire fence since 1883

PAGE

nation-wide service through 76 service plants

FENCE

Fence of Armco Ingot Iron fabric is exclusive with Page

Page Fence is a Product of The Page Steel & Wire Company, an Associate Company of American Chain Co., Inc.

CHAIN LINK OR ORNAMENTAL WROUGHT IRON

SEND FOR YOUR CATALOG ON

PARK AND POOL EQUIPMENT

This catalog lists a great variety of playground equipment of superior design and construction. It deserves your consideration.

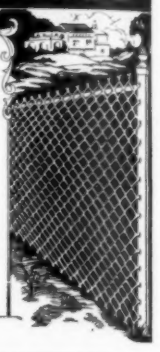
AMERICAN PLAYGROUND DEVICE
ANDERSON, INDIANA

Install Stewart Fence

Want an answer quickly? See pages 536, 768, 769 and 801 of the 1931 Municipal Index for latest Fence specifications. And always — ALWAYS —get Stewart to figure on your requirements for Wrought Iron and Chain Link Wire Fences.

The Stewart Iron Works Co., Inc.
702 Stewart Block
Cincinnati, O.

Stewart IRON AND WIRE FENCES



EverWear

Playground and Water Apparatus

The recognized standard of safe and permanent equipment value for the playground and swimming place.

Write for the new 1931 Catalog No. 23

The EverWear Manufacturing Company
Box 103, Springfield, Ohio

The MADISON

Overlooking Ocean at Illinois Avenue

ATLANTIC CITY, N. J.

Autumn's in the air . . . for the better enjoyment of the season . . . for the charm of Colonial antiquity . . . service as modern as tomorrow . . .comfort that gives a true, new luxury to rest and play . . . come to THE MADISON.

Attractive Fall Rates on American or European Plan

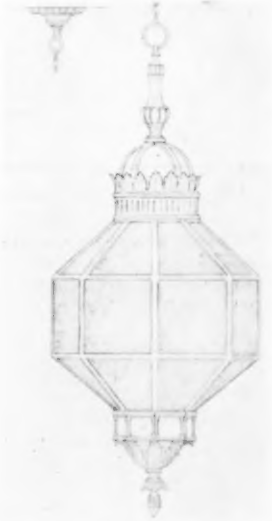
FETTER & HOLLINGER, Inc.
EUGENE C. FETTER, *Managing Director*

A New Ornamental Lighting Unit

A semi-indirect ornamental and dust-resisting lighting unit, designated as the L-1000, made in the shape of an octagonal lantern composed of 25 specially designed refracting plates held in a suitable frame with an internal prismatic reflector, has been introduced by the Holophane Co., 342 Madison Avenue, New York.

This unit is made in three architectural styles and takes from 500- to 1,500-watt lamps. It is 32 inches wide and from 4 to 5 feet long, depending upon the design.

All prisms are on the inside, with the outside surfaces smooth. Access to the inside of the unit is gained through a hinged section of the middle tier of lenses. Re-lamping and internal cleaning are done through this opening. The



THE HOLOPHANE L-1000 LUMINAIRE

fixture is made of bronze and can be supplied in either painted or polished finish.

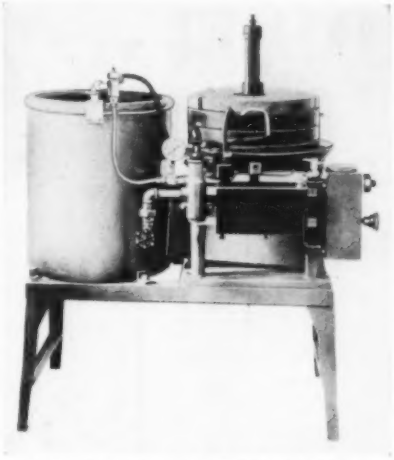
Controlled light distribution is accomplished through the cooperation of the internal reflector with the outer lenses. This luminaire is intended for use in interiors of monumental dimensions or character.

New Electrolytic Chlorinator

Small water supplies and swimming pools can be adequately and efficiently chlorinated with the new W & T electrolytic chlorinator, made by Wallace & Tiernan Co., Inc., Newark, N. J.

This chlorinator generates chlorine gas from a saturated brine solution, mixes the gas thoroughly with the correct proportion of water and delivers uniform chlorination at the point of application. The rate of gas generation is easily controlled by the turning of a rheostat. Should the water supply be accidentally cut off, gas generation automatically stops, gas being generated only when it may be properly carried away.

The unit is ruggedly built and is inexpensive in operation. The current consumption is the equivalent of one 150-watt bulb. Where current is not available, the chlorinator can be used to operate from dry cells or storage batteries.



THE NEW W & T ELECTROLYTIC CHLORINATOR

Efficient Road Oil Distributors

A road oil distributor which may be mounted on a truck chassis and driven from a power take-off or which may have a separate motor drive and the complete installation placed in the dump body of a truck, is made by the Sacramento Engineering and Machine Works, Sacramento, Calif.

Standard equipment on the BLJ distributor includes tachometer, oscillating manifold, oscillating spray bar, 16 Baker type 3-way valves with nozzles, submerged 4-inch flange connected rotary pump with 3-way pump valves for pumping oil from trailer trucks or tank cars into the distributor, 2-inch asbestos insulation around the tank, which is armored with a sheet-metal jacket, removable baffle or surge plates, removable manhole screen, operator's signal bell, drain valve, and complete gage and lever control. The tank is of 1,000-gallon capacity and is made of 3/16-inch plate with ¼-inch heads. It is 9 feet long by 53 inches in diameter and is mounted on a 6-inch I-beam sub-frame.

The oscillating spray bar places the oil exactly according to specifications, regardless of the distance of the spray bar from the road. The bar may be adjusted to turn the valves to a vertical position, insuring a proper coating of material. The exact tachometer control gives correct oil distribution per square yard of road material.

THE BLJ ROAD OIL DISTRIBUTOR MOUNTED IN A DUMP-TRUCK BODY AND OPERATED BY AN AUXILIARY PUMP

New Side- and Rear-Dump Trucks

The new Wood Threeway hoist and body dumping unit for any size and type of truck chassis, has been announced by the Wood Hydraulic Hoist & Body Co., Detroit, Mich.

The light, strong, all-steel construction of the hoist and body of the new unit gives minimum dead weight with greater truck earning capacity, and the simple design and sturdy construction make the unit practically fool-proof and able to withstand abuse and severe service. The new electrically welded subframe design of the body gives great strength and durability to the unit.

MODEL T WOOD HYDRAULIC THREEWAY DUMPING UNIT ON 2½-TON ROADBUILDER CHASSIS

The hoist itself is of the single-unit hydraulic type, consisting of a 4-section telescopic cylinder with the oil pump and reserve tank built in as part of the complete hoist assembly. It applies lifting power direct to the body-center and, being mounted on double-oscillating trunnions at top and bottom, the telescoping cylinder gives a direct-line hoist thrust at all times. The cylinder sections are of special wrought steel, the double-wall of the cylinder serving as the return channel for oil after the maximum hoisting height is reached.

Cuts from straight up to 45° angle downward.

Save money with the NEW Rawls "Super-Mower"

Mows at from 8 to 25 miles per hr.

Developed during a quarter century of constant refining, by specialists on mowing machines and nothing else, the Rawls Type 31 is absolutely the "last word" in motor sickle mowers. It is entirely new and different from traditional types, both in appearance and operation.

YOU SAVE money in first cost . . . simplification of design and manufacture has reduced the price to a fraction of what you would expect. YOU SAVE the grief and high operating expense that usually accompany mowers. YOU SAVE time . . . it mows at from 8 to 25 miles per hour!

Write for further details on the outstanding and exclusive features of the Rawls Type 31 Mower.

PRICE
$275.00
net
FOB Streator.
Spare wheel, tire, bearings, and spindle, $25.00 extra.

RAWLS

MANUFACTURING COMPANY

202-210 Iowa Ave., Streator, Ill.

High, tough weeds are a cinch for the Rawls 31.

Watch This Space Next Month!!

FOR
IMPORTANT ANNOUNCEMENT
OF
NEW POWER OPERATED
HOISTING EQUIPMENT
ON

FRINK SNO-PLOWS

CARL H. FRINK

Manufacturer

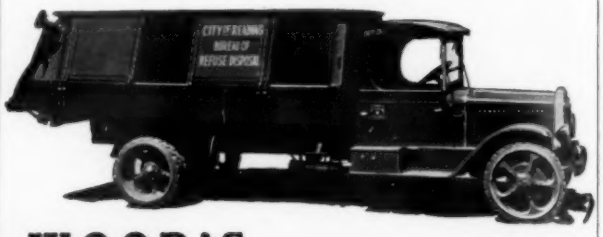
CLAYTON
DAVENPORT LOCO. & MFG. CORP.
Davenport, Iowa

1000 ISLANDS

NEW YORK
FRINK SNOW-PLOWS of CANADA, Ltd.
Toronto, Ontario

Garbage
Rubbish
Bulky Objects
Trees, Snow, Ice

any refuse can be carried with



WOOD'S ALL-PURPOSE SANITATION UNIT

This super-rugged body easily handles all types of refuse—garbage and rubbish. Loading space on top for trees and other bulky objects. Closely-lined doors and sealed seams prevent flow of dust, ashes or liquids. Low chassis mounting makes easy hand loading at sides. Sliding, self-locking side doors; easily-operated top doors for snow loading. Automatically-opened tailgate. Self-trimming. Ranges of sizes available. Write for literature.

WOOD HYDRAULIC HOIST & BODY CO.
DETROIT, MICHIGAN

Equipment for Washing Garbage Trucks

A line of car washers ranging from a one-gun outfit for the small municipal or private garage to the big six-gun Hardie, which easily handles the task in the largest fleet service terminal, has been produced by the Hardie Manufacturing Co., Hudson, Mich.

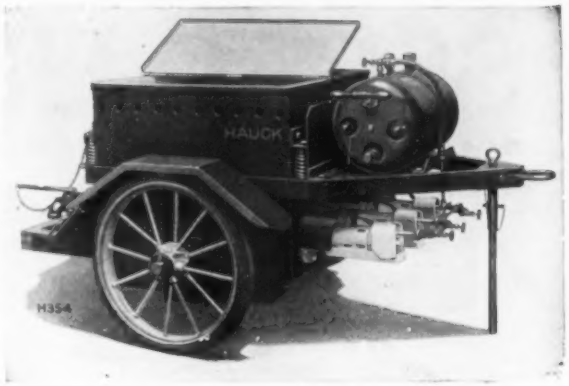
In the smaller pumps, the valve cage and seat are cast integral of hard bronze, using a bronze ball valve. In the four- and six-gun car washers, the cage is cast brass, and the seat is a rust-proof, very hard steel alloy called nitralloy. A hard stainless steel ball is used. Die-cast, removable and adjustable bearings are used for crankshafts and countershafts. The automatic oiling devices used are simple in design and operation, and each working part has its individual oiling system open to inspection instantly.

The heavy-duty two-gun washer has a pump speed of 65 r.p.m. and a capacity of 12 gallons per minute at 400 pounds pressure. Three-quarter-inch galvanized pipe is used for the discharge and 1-inch galvanized pipe for the intake. The motor is of the 3-horsepower standard enclosed type. The drive is through a silent chain on steel sprockets. A 50-gallon tank for soap solution or cleaning compound is furnished as additional equipment. This type of washer is especially recommended for use in municipal garages and for washing out garbage trucks at incinerators.

THE HARDIE HIGH-PRESSURE CAR-WASHING MACHINE

A Combination Asphalt Tool and Cement Heater

The Hauck combination asphalt tool and cement heater, made by the Hauck Manufacturing Co., 105 Eleventh Street, Brooklyn, N. Y., is designed for use on the construction, as well as the maintenance, of roads and streets. It speedily heats tampers, smoothers, shovels, rakes, and the binder cement in warm, windy or cold weather. The controlled and covered fire in the asbestos-insulated tool-heating chamber conserves the heat from the three burners and accounts for the low fuel consumption. Usually only two burners are needed. The hauling of fuel to the job is eliminated, as a full day's supply may be taken along in the 20-gallon tank. Not only is the smoke nuisance done away with, but also the disposal of ashes and the danger from sparks. To start the heater takes only a few minutes, and the chamber is soon hot and ready for tools. The entire heater is built on the trailer principle, to make it easy to haul around.



HAUCK COMBINATION ASPHALT TOOL AND CEMENT HEATER

As the name implies, the heater is a combination of a 16-tool capacity asphalt tool heater and a 75-gallon capacity asphalt binder cement heating kettle. The general construction is similar to that of the Hauck asphalt melting kettles, 12-gage steel plate being used throughout, excepting in the melting tank, which is of 10-gage steel. Four-point spiral spring suspension and shock absorbers cradle the tool-heating chamber and cement kettle, which permits fast trailing. The chassis is of 3-inch by 5-pound channel iron, with double arc welded or riveted joints, mounted on steel or rubber-tired wheels on a 1-9/16-inch diameter heavy steel axle secured with trunnions on 8-inch channel iron. The wheels are on heavy-duty roller bearings, and the hubs are protected from dirt and dust by caps and have large grease-cups and reservoirs. A forged wrought iron pulling eye is welded to the chassis. A 1-inch cold-rolled steel collapsible and adjustable drop leg with a positive locking pin supports the heater when not being trailed. The tool-heating chamber bottom is ribbed with heavy angle-iron to properly support the weight of the paving tools. The sides are insulated with ½-inch asbestos board to conserve the heat and prevent warping, and the 75-gallon capacity melting tank is provided with hinged covers, and a large perforated screening plate allows only the hot material to flow to the 1½-inch draw-off cock which has a lever handle and 1½-inch spout.

The oil-burning equipment consists of three Hauck torch flame burners and a 20-gallon capacity tank. A cast iron nozzle at the flame outlet protects the burner coil and shell, assuring longer burning service. The removable burner coils are made of seamless steel tubing, specially heat-treated to remove scale. The burners are equipped with mounting flanges, wind-breakers, flap type windshields, and individual needle valves and oil strainers, so that one, two or three burners can be used, as more or less heat is wanted.

New Vice-President for Headley

Edgar S. Ross, President, Headley Emulsified Products Co., Franklin Trust Building, Philadelphia, Pa., has announced the appointment of J. G. Campazzie as Vice-President, Directing Sales.

A Brush Attachment for Putting Green Mowers

Owing to the fact that certain strains of bent and Bermuda grass have quite a tendency to become matted and form a nap, making an uneven putting surface, a great many greenskeepers are accustomed to brushing their greens lightly practically every time they are mowed.

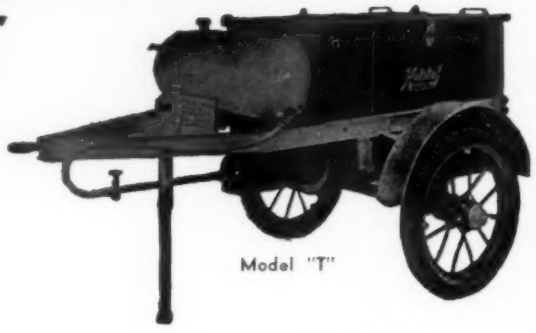
To meet this demand, the Ideal power putting green mower, made by the Ideal Power Lawn Mower Co., Lansing, Mich., and described on page 179 of the March issue of THE AMERICAN CITY, is now offered with brush attachment. The Greens Brush is quickly and easily attached to the mower. The teeth of the brush are of spring steel, and a small link chain attached to the brush is adjustable to regulate the pressure of the brush on the green. This chain raises the brush from the ground when the mower is tipped back for turning, and when the brush is not in use, the chain holds it up off the green.

THE IDEAL POWER PUTTING GREEN MOWER WITH BRUSH ATTACHMENT

SPEED UP! ASPHALT MELTING

Hotstuf
TRADE MARK REG.

the
Elevated
Melting Chamber
HEATER



AND AT THE SAME TIME

CUT MELTING COSTS!

QUICK ACTION. The hottest flame is under the melting chamber and as fast as the asphalt melts it runs down into the melted chamber, leaving the melting surface clean of sediment and in direct contact with the cold material. The long heat travel passes under the already melted material heating it up to the desired working temperature.

NO COKING. The elevated melting chamber eliminates overheating the already melted material and forming a coke with the sediment. This cannot be prevented in the round bottom kettle.

NO WAITING. The melted asphalt never comes in contact with the cold asphalt, so that reloading of the heater never lowers the temperature of the hot asphalt.

MAXIMUM EFFICIENCY. The absence of coke and melted asphalt on the melting surface eliminates an insulation through which the heat must travel to reach the cold material to be melted, giving maximum efficiency in melting and heating and prevents burning out of kettle bottoms.

Distributors in Principal Cities

MOHAWK ASPHALT HEATER CO., Schenectady, N. Y.

HICKORY FIBER
for
ROTARY SNOW BROOMS
STREET SWEEPERS
HAND BROOMS

HUNTSVILLE Hickory Fiber for all types of brooms is an unconditionally guaranteed product that will give consistent and economical service over long periods of time—sweeps clean the roughest pavements—handles the heaviest refuse with ease. Each fiber is a live, springy, flexible broom filler made from the best selected green hickory, thoroughly cured, and rigorously inspected. It will pay you to investigate, write today.

The Huntsville "Trade Mark" on every bale is your guarantee. Look for it.

FAULTLESS FIBER
HUNTSVILLE
HICKORY
FOR STREET SWEEPERS

Write today for the Booklet "The Story of Huntsville Hickory"

FRANK H. FORD, President

HUNTSVILLE
FIBER & VENEER WORKS
HUNTSVILLE ALABAMA

At last a
SAFETY - V - SIDEWALK PLOW

Plow works on a pivot. When striking curbs, stakes or trees the plow swings on pivot eliminating breakage to plow or truck. A light truck can now be used in winter at a great saving over other methods. Drop two pins in the pivot device and you have a rigid V. Useful in alleys, drives and streets

ROOT SPRING SCRAPER CO. KALAMAZOO MICHIGAN

HONHORST TAR HEATERS
"Built for service"

ALL STYLES
Portable and Stationary
25 to 200 gallons

See our page in Street Construction Section, Municipal Index, for the Kettle you need.

Write for Pamphlet No. 15 on the New Oil Burning Heater

THE JOS. HONHORST CO.
1016 W. 6TH ST. CINCINNATI, O.

THE FUNFLOTE IN USE

A New Air Raft for Water Sports

A popular piece of equipment wherever there is water, whether it is in roped-off stretches of ocean, artificial pool, lake, river or stream, is a new air raft which is built to stand hard use and which offers great possibilities for amusement.

The Funflote, made by Converse-Hodgman, Malden, Mass., is covered with gaily striped awning duck on top and green drill beneath. It is made in two sizes, 30 x 72 inches for adults and 25 x 48 inches for children. The raft can be used for many water games and sports, such as tilting, water polo, paddling, races and diving, and is especially useful in teaching swimming. The rope hand-holds, strung from corner to corner, make it it very easy to grasp, and its buoyancy will support several adults at one time.

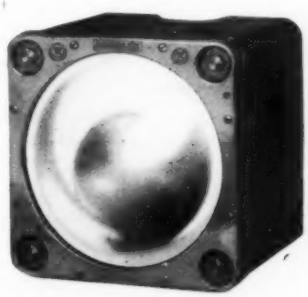
The Funflote created considerable interest on July 4, 1931, at Lynn Beach, Mass., when a man swimming in deep water was suddenly seized with a cramp. The life guard was not near him, and the only one who heard his outcry was a high school boy who happened to be a strong swimmer. He seized a Funflote and swam out to the man. He got to the man in time to grasp him and, with the aid of the Funflote, supported him easily until the life guard could reach him. While the raft was not designed as a piece of life-saving equipment, it did play a most important part in what might have been a fatal accident.

Under-Water Lighting for Swimming Pools

Night swimming does not appeal to some people because darkness gives the feeling that water has black uncanny depth, but underwater lighting transforms a pool to an inviting rendezvous for every bather. With underwater lighting, water sports are also possible after sundown. Larger audiences can take advantage of evening performances, and a lighted pool is a colorful attraction that will win increasing patronage for water sports.

Lights and lighting equipment designed to vary color from pastel shades to deeper hues have been brought out by the Westinghouse Electric & Manufacturing Co., Cleveland, Ohio. The Westinghouse Type W Aqualux underwater lighting unit, which uses a 250-watt Mazda lamp, and the Type C Aqualux underwater lighting unit, which uses Type G-Bulb lamps in sizes ranging from 500 to 1,500 watts, are designed for underwater lighting of swimming pools and fountains, and for other aqueous applications.

For indoor pools, a minimum of 2½ watts per square foot is recommended. Medium-size units, placed uniformly along the sides and on the deep end, supply this illumination, the spacing varying with the size of the pool. On the deep end, however, they are about half as far apart as on the sides and are equipped with sidewise and downward reflecting lenses to illuminate the deep water for diving. If the pool has a width of 100 feet or more, a few widely spaced projectors are installed in the shallow end wall. The best mounting depth for submerged units is 2½ feet below the surface of the water. This depth is practical for servicing and maintenance and is out of the way of swimmers.



WESTINGHOUSE TYPE W AQUALUX

Underwater lighting in outdoor pools is carried out in the same manner. Pools of ordinary size, less than 75 feet wide, use small units because they distribute the light evenly. Larger pools frequently install the small units using 250-watt lamps, but the greater number required may make the cost prohibitive, in which case it is more economical to use Aqualux Type C units of 500 or 1,000-watt size. These are especially recommended for pools of 10,000 square feet area or more.

In outdoor pools, special illumination may be needed for diving boards, chutes and floats. Floodlights, arranged wherever possible to direct their beams along the observer's line of vision, illuminate the fixtures without glare. Public outdoor pools require that the fixtures be mounted quite high above the level of the ground. Ordinary industrial type reflectors may be mounted 15 to 20 feet above the walk on standards about 20 feet apart. A more imposing installation consists of powerful street-lighting lamps with refracting glassware directing the light downward to the useful plane. To avoid glare, they are mounted 25 to 35 feet high. With industrial reflectors or high-powered street lamps, about 10 to 20 watts per running foot of walkway are necessary.

Wrench Visits Offices in Pacific Coast

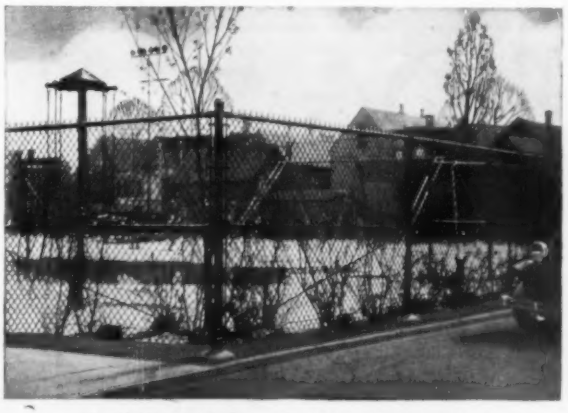
J. Wrench, Sales Manager of the Industrial Chemical Sales Co., Inc., New York, started on August 14 for a trip to the coast, where he will visit the sales offices of the company in connection with the sale of Nuchar activiated carbon. On his return he will stop at Denver and Chicago, arriving in New York the second week in September.

Solving Municipal Fence Problems

In Pittsburgh Chain Link Fence, made by the Pittsburgh Steel Co., Pittsburgh, Pa., consideration has been given to the requirements of parks, playgrounds, golf courses, athletic fields, airports and other municipal needs. The standard construction of this fence includes a sturdy framework of copper-bearing seamless steel pipe terminal posts, top rail and gate frames, solid H-section line posts and fittings of heavy malleable iron and pressed steel. Line posts of seamless steel pipe are available where desired.

The chain link fabric of which the fence is constructed is made of copper-bearing steel wire, heavily zinc-coated after weaving. The steel pipe framework is also copper-bearing and heavily zinc-coated.

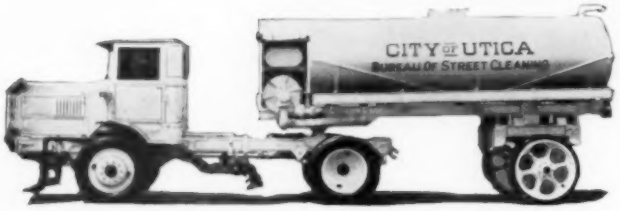
The Pittsburgh adjustable barbed wire arm is adjustable to three positions. The barbed wires are fastened with stitch wires, and the deep socket excludes moisture from the post. The new heavy-duty hinge combines the advantages of full-gate opening, 180-degree swing of gate and, in addition to supporting and reinforcing the gate, concentrates the weight at the ground line.



AN INSTALLATION OF PITTSBURGH CHAIN-LINK FENCE AROUND A PUBLIC PLAYGROUND

ANOTHER CITY ADOPTS
STREET FLUSHING
AS THE METHOD OF STREET CLEANING

MOTOR TRUCK FLUSHERS AND SPRINKLERS



SEMI - TRAILER AND FOUR-WHEEL TRAILER FLUSHERS AND SPRINKLERS

HVASS DOUBLE UNIT, SEMI-TRAILER FLUSHER

Investigate the Advisability of Installing Hvass Flushers in Your City to Obtain

Sanitary, Economical and Efficient Street Cleaning Without Interference With Vehicular Traffic or Parking.

LOW COST **NO DUST RAISED** **SEWERS FLUSHED**

We Shall Be Pleased to Furnish Full Information on Request

CHAS. HVASS & CO., Inc.
Manufacturers—Est. 1872
OFFICE: 508 EAST 19TH ST. NEW YORK CITY, N. Y.

CONNERY'S TAR and ASPHALT KETTLES

STURDY—RELIABLE—MODERN

Style JJ-1 Oil-Burning Heater, 210 gallons

In the Connery Kettle you get a complete, dependable and modern outfit; one that will economically handle the toughest job and is built to stand the abuse of heavy service.

WRITE TODAY for our little "BLUE BOOK" illustrating our complete line

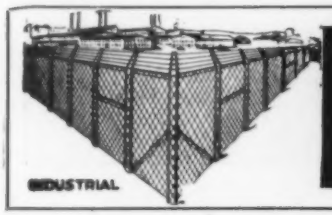
CONNERY & CO., Inc.
4000 N. Second Street
PHILADELPHIA, PA.

Style BB-5 Trailer Heater, 300 gallons

LAY
Lay Split Hickory Fibre

for street cleaning brooms is made by special-built machinery which insures higher grade product. A trial will convince you. Write us for prices.

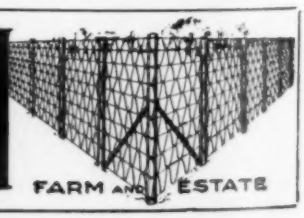
THE LAY MANUFACTURING COMPANY
DALLAS J. G. Carrier, *Manager* NORTH CAROLINA



SWEET'S STEEL POSTS

Rolled from the highest grade Carbon steel --- easy to drive --- self contained --- with pleasing appearance and high safety factor.

Write for Descriptive Catalog
SWEET'S STEEL COMPANY
WILLIAMSPORT, PA.



THE G.E. TYPE ALF-2 FLOODLIGHT FOR HANGAR LIGHTING

A New Hangar Floodlight

A new type of floodlight, designed for the illumination of aprons in front of hangars, approaches to buildings and the interiors and exteriors of hangars, has been announced by the General Electric Co., Schenectady, N. Y.

A fresnel lens and a 5-inch silvered-glass spherical mirror distribute the light smoothly and efficiently throughout approximately 180 degrees in the horizontal plane, with a vertical divergence of about 118 degrees.

The new Type ALF-2 floodlight is equipped with an adjustable, mogul screw-base lamp socket for centering the filament with respect to the focal point of the mirror and lens. The floodlight will accommodate either a 1,000-watt, 115-volt, T-20 airway beacon lamp with a light-center length of 4¾ inches, or a 500-watt, 115-volt, G-40 lamp with a light-center length of 4¼ inches.

The floodlight is constructed of non-rusting metal and is weatherproof. It is furnished for mounting on vertical or horizontal flat surfaces, or for mounting on a 2-inch pipe.

Mehren New President of Portland Cement Association

The Portland Cement Association, 33 West Grand Avenue, Chicago, Ill., has formerly selected as its President the president of one of the portland cement manufacturing companies. During his term of office he has not only guided the work of the Association, but has also continued to operate his own company. The duties of the Association President are so heavy, however, that the industry felt it unfair to continue to impose this burden upon the president of any one of its member companies.

The Board of Directors has elected as President, Edward J. Mehren, Vice-President of the McGraw-Hill Publishing Co. Mr. Mehren was for ten years Editor of *Engineering Record* and *Engineering News-Record*. Later he became Vice-President and editorial director of the McGraw-Hill Publishing Co., and recently has been in charge of the company's activities in the Middle West, with headquarters at Chicago. He assumed his new office on September 1.

Pennsylvania Enters Large Tractor Order

More than one hundred million dollars has been appropriated for new roads in Pennsylvania, of which a large amount is to be spent for new highway equipment, the balance to be used in building 20,000 miles of new roads and for the improvement of 11,000 miles of present highways.

This road program has been launched under the slogan, "Get the farmers out of the mud," and is expected to be completed within two years.

The Cleveland Tractor Co., Cleveland, Ohio, recently received two large orders from the State Highway Department for a total of 153 crawler-type tractors. As a direct result of this order, approximately 500 men have been returned to work by the Cletrac company.

Nye Corporation Not in Any Merger

The Nye Odorless Incinerator Corporation, with headquarters at Macon, Ga., of which A. C. Felton, Jr., is President and in charge, announces that there is no connection between that corporation and any other incinerator company. There has been no merger or consolidation or coalition or any other connection whatsoever discussed or considered with the present management of this corporation.

The Nye Odorless Incinerator Corporation, under a different management, had its headquarters at Albany, Ga., from September, 1929, until May, 1931, when the voting power of the Corporation, on account of defaults in the charter provisions, passed to the holders of the prior preferred stock and the business was turned back to the prior preferred stockholders by the courts.

Those interested in Nye Odorless incinerators should address the corporation at Macon, Ga.

Columbian Assistant Sales Manager Dies

J. T. Vinson, transferred by Columbian Iron Works from Chattanooga to the newly created position of its Southwestern Sales Manager at Dallas, died suddenly on July 9, while bathing in the Gulf at Galveston. Mr. Vinson had been for some years Assistant Sales Manager.

Consulting Engineers Consolidate

The consolidation of the consulting engineering organization of Symonds & Stevens with X. Henry Goodnough, Inc., 14 Beacon Street, Boston, Mass., has been announced. This company will engage in consulting engineering practice on water supply, drainage, sewerage, sewage disposal, river improvement, and the disposal of municipal and trade wastes.

The September Front Cover

We are indebted to the Bank of Manhattan Trust Company, 40 Wall Street, New York, for the interesting front cover appearing on this issue of THE AMERICAN CITY. The illustration is one of a series of six great mural paintings by Ezra Winter. The mural reproduced is the central panel on the east wall of the main banking room. The Manhattan Company, soon after its chartering by the state of New York, set about laying a water system for the city. The mural shows the work of laying the wooden logs, which were the first water mains in 1800. In the background is old Federal Hall at Nassau and Wall Streets. To the extreme right may be seen Alexander Hamilton, one of the founders, and Oliver Wolcott, first President of the Merchants Bank, established in 1803, which was merged with the Bank of the Manhattan Company in 1920.

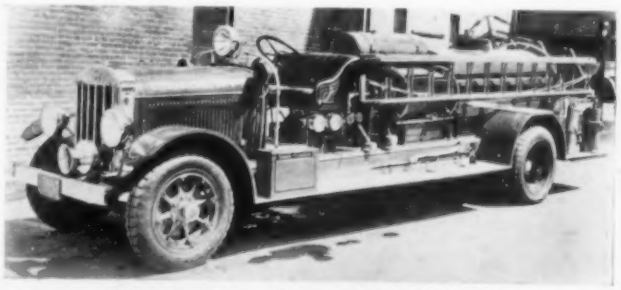
Clow Treasurer Dies

Orlando Ware, Treasurer of James B. Clow & Sons, Chicago, died on Sunday, August 2, at the age of 72, after more than 30 years' service with the company.

New Fire Engine for Fresno

Replacing the first piece of motor equipment in service in the Fire Department of Fresno, Calif., Chemical No. 1 was assembled and designed on a Reo Speed Wagon chassis, made by the Reo Motor Car Co., Lansing, Mich.

This apparatus was constructed for the most part in the Fire Department shops under the supervision of E. L. Burtner, Master Mechanic. In a demonstration, it discharged 357 gallons of water in 2 minutes. In addition to a 357-gallon tank, equipped with two sets of hose, the truck carries smoke masks, first aid equipment, and especially designed ladders for fighting fires in homes.



NEW CHEMICAL APPARATUS MOUNTED ON REO CHASSIS IN USE AT FRESNO, CALIF.

MICHIGAN AVENUE, CHICAGO, ILL., looking south from Superior Street. Trinidad Native-Lake Asphalt laid in May, 1919

A decade of service in Chicago traffic!

A worthy record, you'll admit. Paving *must* have durability to stand up under 24-hour-a-day pounding of traffic on one of the world's busiest thoroughfares.

It's the same story the world over—city or town—Trinidad stands the gaff. Wherever it is laid, Trinidad demonstrates its resistance to wear, its immunity to attacks of weather—its natural superiority to any man-made bituminous paving material.

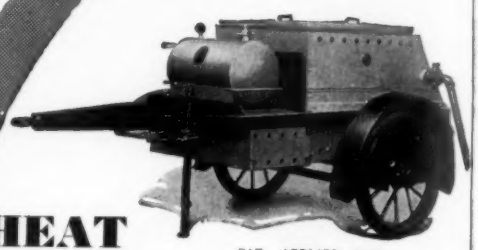
For road building—Bermudez Road Asphalt—another Native-Lake Asphalt—has demonstrated its merit. Write for interesting facts.

THE BARBER ASPHALT COMPANY

New York PHILADELPHIA Chicago
St. Louis Kansas City San Francisco

TRINIDAD NATIVE LAKE ASPHALT

THE SIGN OF A GOOD HEATER
LB
LITTLEFORD BROS. CINCINNATI, OHIO



HEAT

PAT. APPLIED FOR

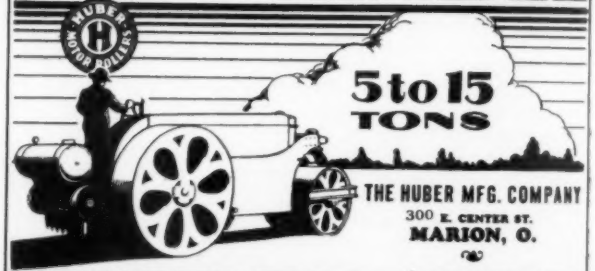
Where it is needed!

The Littleford No. 90 Combination Tool Heater and Asphalt Cement Kettle is the only outfit of this kind that has a patented damper to control heat between tool heating compartment and A. C. Kettle. Let us tell you how it heats tools and melts asphalt.

LITTLEFORD
Road Maintenance Equipment
SINCE 1900

LITTLEFORD BROS., 500 E. Pearl St., Cincinnati, O.

DEPENDABLE



THE HUBER MFG. COMPANY
300 E. CENTER ST.
MARION, O.

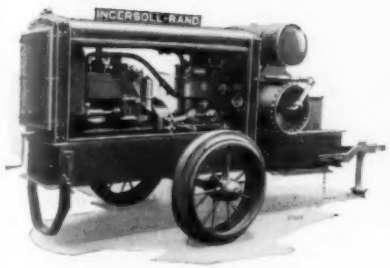
HUBER 4 CYLINDER MOTOR ROLLERS

ACCOMMODATIONS FOR *TWO* IN A DOUBLE BEDDED ROOM at the USUAL SINGLE RATE! . . $3.00 to $5.00 Daily

600 Bright, sunlit rooms . . . each with bath, electric fan, and ice water. Adjacent to every activity.

HOTEL PICCADILLY

45th ST. WEST OF BROADWAY
New York



I-R "SPEED TRAILER" PORTABLE COMPRESSOR

A New Portable Air-Compressor

A portable air-compressor, designed for high-speed towing, is a new addition to the line of the Ingersoll-Rand Co., 11 Broadway, New York. The Speed Trailer consists of a standard 5½ x 5-inch gasoline-engine-driven compressor mounted on two rubber-tired steel wheels. Because of the low center of gravity, it can be towed behind a truck on a good roadway at 30 to 35 miles per hour. When detached, it can be moved about by one man, so that it is especially adapted to quick-service jobs by public utility companies, street departments, etc.

The steel frame forms a tool-box 6 x 2 feet, providing ample room to carry all the tools and accessories ordinarily used with this size of compressor. This leaves the truck or other towing vehicle free to serve its usual purpose.

The complete outfit is 13 feet, 10 inches long, 6 feet wide, and 5 feet, 9 inches high. It has a piston displacement of 120 cubic feet per minute and is designed for a working pressure of 100 pounds per square inch. Removable steel side doors permit enclosing and locking the unit when it is not in use.

Among the operating features of this compressor are an air-sealed compressor unloader, air-sealed engine speed controller, after-cooler and Type K plate valves.

A Mower for Large Areas

The Quintet Titan mower, made by the F. & N. Lawn Mower Co., Richmond, Ind., is an assembly of five mowing units which cuts a clean 12-foot swath. While this mower, which is adaptable for use with the McCormick - Deering Fairway tractor, or any other standard make of tractor, is sturdily built, the weight is so distributed that the turf cannot be injured. There is just sufficient weight to give the turf a gentle rolling.

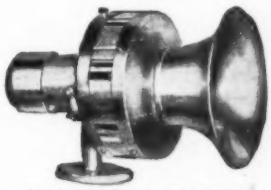
The frame is so designed that the mowers float over uneven surfaces, each mower acting as independently as if operated as a single unit. They will take any grade, are easily steered, and can be turned around completely in a very small space.

The Quintet easily cuts 75 to 100 acres a day. Three-and five-unit outfits can be quickly converted from one to the other by manipulating two kingpins to add or detach two outside rear wings and mowers.

A New Fire and Police Apparatus Siren

Modern-day traffic conditions demand the most powerful toned of apparatus sirens. Their tone blast is essential for safety. Speed is naturally expected from fire and police apparatus and from ambulances when emergencies call.

The Federal Coaster siren, made by the Federal Electric Co., Chicago, Ill., has quality and strength of tone volume which makes it heard for blocks ahead. When pressure is released on the switch, the rotor continues to roll freely or "coast" for several minutes. The rotor on this siren is snapped into full speed within a second after the push-buttom switch is pressed. An unbroken tone roar of great volume is thus obtained with little use of battery current.



THE FEDERAL COASTER SIREN

The siren is 15 inches long and 10¼ inches high and weighs, complete with cable, 20 pounds. The diameter of the projector, which is recommended for use on larger pieces of apparatus, is 9 inches. The rotor is 8 inches in diameter, and the whole siren has a chrome plate finish. It is furnished for 6 or 12 volts direct current, complete with bracket, cable and operating switch.

THE BENJAMIN BIG BEN FLOODLIGHT

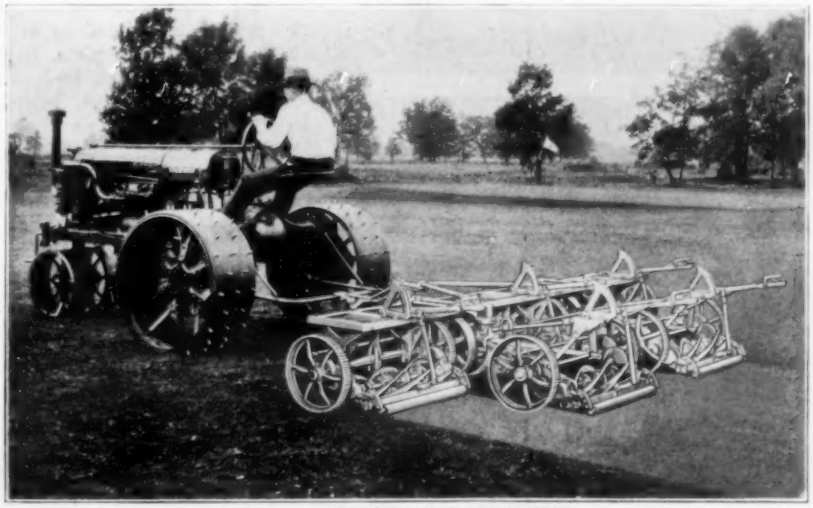
A New Large Floodlight

Particularly suited for the lighting of the larger size outdoor sport and recreational areas and large industrial yards and construction grounds, where uniform lighting is required over a considerable area and at some distance from the location where the units are mounted, the new Big Ben floodlight has recently been placed on the market by the Benjamin Electric Mfg. Co., Des Plaines, Ill.

This new open type diffusing floodlight combines a powerful long-range forward throw of light with adequate ground coverage in the areas near the unit. It is a combination of two distinctly different surfaces, consisting of a large inner reflector of oxidized aluminum surrounded by a large porcelain enameled steel diffusing reflector.

Uniform lighting over a wide area is obtainable with moderate mounting height with this unit, and a spacing distance of as much as five times the mounting height may be used effectively between rows of units across the area to be lighted. A considerable amount of light is distributed forward and upward into the air, resulting in high and unusually uniform illumination in the areas above the ground. This permits adequate lighting of moving and stationary objects, so that it is possible to follow the flight of a baseball or football or to see clearly the movements of industrial cranes, hoists and other construction machinery.

This floodlight is very rugged and durable to withstand the severest conditions of outdoor use. It is weatherproof, and only materials that offer the greatest resistance to weathering and atmospheric conditions have been used in its construction.



THE QUINTET TITAN GANG MOWER

Outdoor Lighting

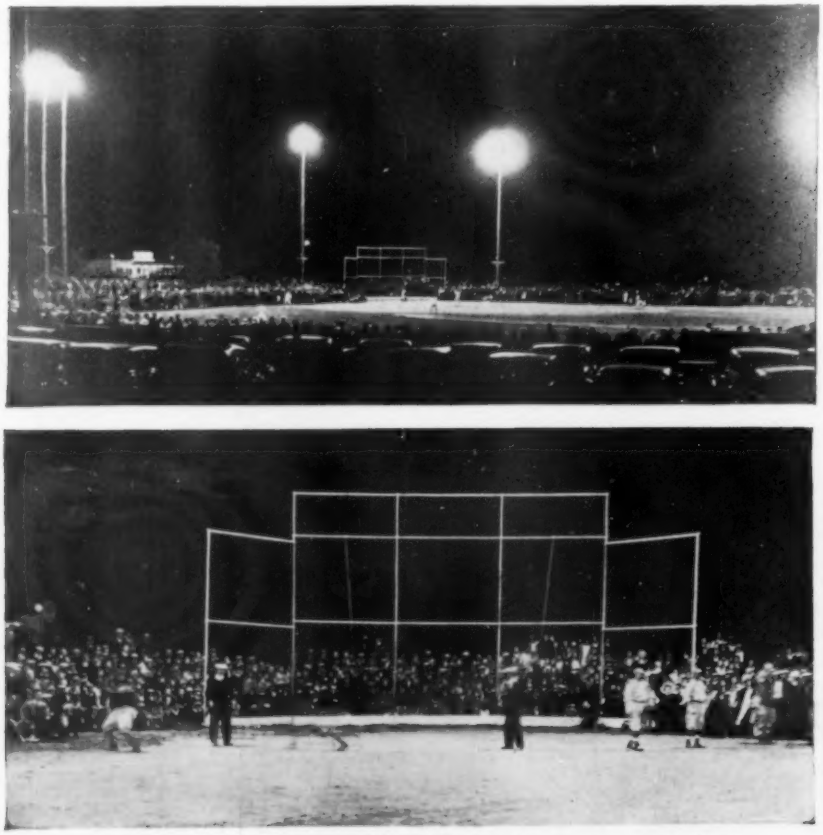
A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Kewanee Provides Night Baseball in Park

By O. F. LYMAN
Secretary, Chamber of Commerce, Kewanee, Ill.

NORTHEAST PARK, a part of the municipal park system of Kewanee, Ill., has become the recreational center for Kewanee and the surrounding district. This has been brought about partly by the construction of a new bathhouse and swimming pool, through the generosity of the late E. E. Baker, Kewanee manufacturer and benefactor, and partly through the inauguration this year of a lighting system for night baseball. This installation by the municipal Park Board is claimed to be the first to be made anywhere for the amateur.

The provision for baseball at night constitutes a great improvement over the "sunset league" idea, in accordance with which amateur or semi-professional baseball teams would meet at the ball-field just after a hurried supper, to play until darkness made it impossible to continue. This widely used plan to enable men who were employed during the day to indulge in the sport of baseball on week-days to some extent at least, usually meant a short game, seven innings as a rule, and that only after a great hurry to get to the field and keep the game going; and as dusk crept over the diamond the playing became more and more unsatisfactory.



BASEBALL FIELD IN NORTHEAST PARK, KEWANEE, ILL., AT NIGHT

In Kewanee a different kind of sunset league operates; the players do not begin their game until the sun has set. The sport is carried on under 50 General Electric open-type, twin-lamp floodlighting projectors on 75-foot wood poles.

A city league of four teams, made up of the best amateur and semi-pro talent available in Kewanee and vicinity, plays games on Tuesdays and Thursdays. Teams are well balanced and keen competition exists. The schedule of 30 games closes on September 10. Attendance at the games runs in the neighborhood of 5,000. The teams are sponsored by the American Legion, Elks, Odd Fellows and the owners of an automobile service station, and are on an amateur basis, neither salary nor expenses being paid. No admission is charged at the games, a collection being taken to meet such expenses as are incurred by the league.

The lighting system, which cost about $7,000, was designed by C. H. Youngdahl, operating engineer of the Kewanee Public Service Co. Six of the projectors are mounted on a pole on each side of the home plate, while beyond first and third bases, well outside the foul lines, are H-towers, built of two poles, each carrying nine projectors. Around the outfield are four poles each carrying five of the lights. Each projector is provided with two 1,500-watt clear lamps. The total load is 150 kilowatts. The complete installation was purchased by the Park Board from the lighting company.

In charge of the arrangement of games and the finances of the league is a board of managers consisting of the managers of the teams and the sports editor of the *Kewanee Star-Courier*.

Various other activities are being planned and carried out at Northeast Park under the superintendency of Bennett E. Rose, to make it an even greater sport center, day and night.

Varieties of Lighting on the Sunrise Highway of Long Island

YEARS ago an indifferent sort of road followed the route of the old aqueduct that carried water from various reservoirs on Long Island to Brooklyn, N. Y. It was known as Conduit Boulevard. With the increasing demand for adequate means of facilitating automobile transportation the advantages of this route as a direct, level artery of traffic between Brooklyn and the southern part of Long Island were recognized, and it was developed into a broad concrete thoroughfare, known as the Sunrise Highway.

Beginning just west of the eastern boundary of Brooklyn, it continues through Queens, which like Brooklyn, is a borough of New York City, and thence through a succession of villages and unincorporated territory for a distance of some 25 miles, coming to its present end at Amityville.

The Sunrise Highway is not lighted as a unit. The state is without authority to install or operate a lighting system, hence this is left to the municipalities and lighting districts through which the highway runs. This, of course, does not make for uniformity, and a considerable variety is presented in the lighting of the various sections.

Some of the highway in unincorporated territory is not lighted at all; in certain other parts of such territory lighting of intersections and small business centers is done through the agency of lighting districts. For the greater portion, however, including nearly fourteen miles, the highway is continuously lighted, as it lies entirely within incorporated territory for this distance, traversing part of Brooklyn, Queens, and the villages of Valley Stream, Lynbrook and Rockville Centre.

IN QUEENS BOROUGH, NEW YORK CITY

New York City

Of 8.03 miles of the highway in New York City, 0.88 miles are in Brooklyn and the rest, 7.15 miles, in Queens. It has a four-lane concrete roadway, 40 feet wide. The lighting is furnished by pendent units, Pemco No. 367A, equipped with Gleason-Tiebout 12-inch carrera glass globes, and inside reflectors above the light source, and suspended from Pemco 336B brackets attached to wood poles. The brackets hold the lamps about 42 inches from the poles, which are set back 5 feet from the edge of the pavement. The light source is approximately 22 feet above the pavement. The lights are staggered, and spaced about 110 feet apart, measured along the center line of the highway. The lamp size used is 400 candlepower (4,000 lumens), on a 15-ampere series circuit. The number of generated lumens per linear foot of highway is 36.3.

Valley Stream

After leaving the borough of Queens, the highway passes for about 12,000 feet through the village of Valley Stream. Here the lighting is somewhat similar to that in Queens, consisting of pendent units on brackets attached to wooden poles. These brackets are the same type

VALLEY STREAM

LYNBROOK, CENTER SUSPENSION

LYNBROOK, BRACKET TYPE

—Pemco No. 336—as is used on the New York City side of the line. The standard lamp is 400 cp. in G.E. Novalux Form 32 luminaires with No. 120 medium alabaster rippled globes. They operate on 15 amperes, obtained by means of auto-transformers from the 7.5-ampere series circuit. The light source is 20 feet above the pavement and about 42 inches from the pole. There are 115 of these units in the village, staggered at an average spacing of 90 feet (180 feet on each side of the road). The number of generated lumens with the 400-cp. lamps is therefore 44.4 per linear foot of highway.

The 400-cp. lamps are installed in the more closely built-up part of the highway, while in the outlying sections, 250-cp. lamps are used, on a 7.5-ampere series circuit. About half of the total number of lamps are of this size, but it is expected that they will be changed to 400 cp. next spring, which can be readily done by auto-transformers.

The lighting in Valley Stream and the adjoining village of Lynbrook is installed and operated by the Queens Borough Gas & Electric Co., under the direction of the respective village governments, on the basis of annual charges for the various kinds of lights.

Lynbrook

There are 44 center-suspension 250-cp. lights on the highway in the village of Lynbrook, 24 being on a stretch of approximately 4,450 feet in the western portion and 20 extending for about 3,300 feet in the eastern part. Between these two groups, in the built-up portion, there are 37,600-cp. ornamental units for a distance of about 1,800 feet. The 250-cp. units are bare lamps, equipped with 20-inch G.E. dome radial wave reflectors and suspended 20 feet above the roadway, and operate on a 7.5-ampere series circuit. The average spacing for the lamps is about 175 feet, and the lumen output about 14.3 per linear foot.

The 600-cp. units in the business section consist of G.E. Form 9 luminaires with No. 118 globes, metal canopies and white enameled reflectors over the lamps. They operate on 20 amperes produced by means of I. L. transformers. The luminaires are mounted on iron brackets, Electric Railway Equipment Co. No. 10469, attached to wooden poles, the light source being 17½ feet above the pavement and about three feet from the pole. The units are placed opposite one another and about 100 feet apart along the highway, which is about 150 feet wide in this portion. About 120 lumens per linear foot of highway are produced.

While the village has not seen its way clear to install ornamental lighting along the entire highway, it is considering the substitution of 400-cp. lamps with the bottom half inside-frosted for the 250-cp. lamps in the center-suspension units.

(*Continued next month*)

The Inbuilt Cutout Street Series Lamp

By **D. S. GUSTIN and ARTHUR J. SWEET**

Development Engineer and Commercial Engineer, Westinghouse Lamp Co.

THE relatively long distances, seldom less than 100 feet, between successive street lighting units and the relatively heavy loads, typically 12 kw. to 25 kw., which it is desirable to operate on a single circuit, determine the series circuit as, under most conditions, the desirable method of energy distribution to employ in street-lighting service.

In any series circuit, when a lamp fails it is obviously necessary to by-pass the lamp in order to avoid outage of the entire circuit. Heretofore this has generally been accomplished by the device known as the "film cutout socket"—a socket in which a by-pass connection between the socket terminals is held "open" by a film of insulating material whose breakdown resistance must, on the one hand, be appreciably higher than the voltage across lamp terminals at the surge which may occur when lamps are turned on and, on the other hand, appreciably lower than the operating voltage of the circuit. Thin laminations of mica, cigarette paper, treated cloth and oxide-coated metal surfaces have been chiefly used for such films.

With the above device, so long as the filament remains intact, the voltage across the lamp terminals is not sufficient to puncture the film, and the current flows through the filament. When, however, the lamp fails, the entire circuit voltage is impressed across the film, the film breaks down, and the current flows through the by-pass, re-establishing the circuit. The whole operation takes place over so short an instant of time that the other lamps in the circuit do not show even a flicker.

Film Cutouts Have One Shortcoming

Despite more than 20 years of service experience and development work, the film cutout socket, as a device for by-passing the lamp on burn-out, has continued subject to one defect. It has heretofore proved impossible to manufacture films, of whatever type, which, with 100 per cent accuracy, will break down close to predetermined voltage.

If, for example, the attempt is made to manufacture a film which will break down at 250 volts, it has heretofore been possible under the most careful manufacture to produce a product in which better than 99 per cent of the films will break down between 150 and 450 volts. An occasional film, however, typically not more than one in a thousand and perhaps not more than one in ten thousand, will "run wild," show a breakdown voltage exceeding 500 volts. When such a film is applied to service and when later the lamp burns out, the resistance of the film to puncture is greater than the voltage drop across the arc which occurs upon burn-out. As a result, the arc, maintained by the metallic vapors which it produces, persists, gradually melting the lead-in wires and occasionally destroying the lamp socket and even the fixture itself. While such occurrences are rare, they are annoying to the central station out of all proportion to the direct losses entailed.

INBUILT CUTOUT BUTTONS

The center hole fits over the tip of the exhaust tube of the lamp bulbs; the lead-in wires pass through the brass-bushed holes on each side

For years lamp engineers have sought to produce a by-passing device which could be embodied in the lamp construction. It is unnecessary here to detail the nature of these various attempts. It is sufficient to point out that the problem has proved extraordinarily difficult, due chiefly to the fact that the device must operate better than 99 times out of the 100, better than 999 times out of the 1,000—must operate with substantially never a failure.

The Inbuilt Cutout "Button"

Facing this problem, engineers of the Westinghouse Lamp Co. conceived the

idea of coating particles of copper powder with a suitable insulating compound, substituting a great number of tiny insulating films for one single film. The novelty of the idea of using one of the best conductors, copper, for manufacturing an insulator is worthy of note.

Experiments along this line indicated the 100 per cent reliability which is a supreme requirement in a device of this character. They also indicated that a device of this character could be manufactured much more accurately to predesigned breakdown voltage than was attainable in any of the types of film theretofore used. This latter feature is of practical importance in that it permits of satisfactory operation when the circuit voltage is as low as 500 v., or even less.

It is sometimes desirable, in serving territory newly annexed to a city, to operate a few lamps on a circuit which will later be extended as the territory is developed or additional territory annexed. With such small circuits, loaded only to 3, 4, or 5 kw., the circuit voltage is, of course, low. The development here under discussion makes it practical to operate such circuits, as could not be done when previous cutout devices were employed.

The inbuilt cutout is made up in the form of a cylinder approximately 19 mm. in diameter and 6 mm. in thickness. This cylinder is pierced by 2 brass-bushed holes through which the lead-in wires pass. The cutout is installed in the base of the lamp between the extreme end of the glass build and the end contact of the base.

When the filament burns out and the circuit is thereby interrupted, the entire circuit voltage is impressed between the two-lead-in wires. The tiny films coating the particles of copper break down and the current passes between the lead-in wires, fusing the copper particles and establishing an actual copper connection between the lead-in wires, thus reestablishing the circuit.

Where the arc which follows the failure of the filament generates considerable metallic vapor, the inbuilt cutout may not operate instantly upon burnout. In rare instances, indeed, the arc in the lamp persists until the filament leads have been consumed to the point where they pass through the press, or glass seal. Even in such cases, however, there is no observable flicker of the other lamps in the series, since the inbuilt cutout will operate within a few cycles whenever the resistance at the arc reaches a certain value, a value far below that which would cause any material change in the current of the circuit.

Breakdown Potential Varies

The difference in potential at which the inbuilt cutout breaks down varies somewhat with the temperature of the cutout. At 300° F. the breakdown value is approximately 50 v. lower than at 75° F. while at 400° F. the breakdown value is approximately 100 v. lower than at 75° F.; 300° F. is a liberal estimate for temperature of base under average conditions of practice, 400° F. an extreme value which will be approached only in equipment where dissipation of heat in base and socket are poorly provided for.

By varying certain elements in manufacture, the difference in potential at which breakdown will occur can be maintained at substantially any desired average value. Individual cutouts will vary throughout a range of approximately 20 per cent above and below this average breakdown value. *Every* individual cutout will have a breakdown value within this range, however, and this is a feature which, from a service standpoint, constitutes the outstanding merit of the inbuilt cutout.

INBUILT CUTOUT IN PLACE
Street series Mazda lamp with section of base removed to show cutout button

The possibility of current leakage across the inbuilt cutout has been exhaustively investigated. Under even the more severe conditions of service, this leakage will be less than 10 micro-amperes (.00001 amp.), an amount utterly insignificant for any influence it may have on the operation of the lamp. Investigation has also established beyond question that this leakage does not increase with service but, to the contrary, shows a slight tendency to decrease.

Up to the present time the device has been developed only for operating currents not exceeding 10 amperes. At higher currents certain difficulties are experienced in providing sufficient conductivity to avoid excessive heating. Development work to date gives promise that these difficulties will be overcome, but for the present the commercial product must be limited to operating currents not exceeding 10 amperes.

The inbuilt cutout has three service advantages:

1. It absolutely eliminates destructive arcing which, while rare with the better types of film cutout socket, was extremely annoying to the central station when it did occur.

2. It permits the operating of light-loaded circuits, a feature of convenience when new circuits are started in outlying territory.

3. It eliminates the cost and bother of installing a film to replace the one which was punctured at lamp burn-out. In this connection it should be noted that line-men are typically very careless with films, and lose or destroy as many as they actually employ in service.

Effect of Lightning

The inbuilt cutout has only one defect. When lightning strikes a street series line where external films are employed, the lamps will at some sockets be destroyed while at other sockets the external film will break down and protect the lamp. With the internal film of the inbuilt cutout construction, the lamp is rendered useless whether it be the filament or the film that is ruptured. Lamp losses through lightning may, therefore, be increased through the use of the inbuilt cutout. It should be recognized, however, that lightning striking a street series line will cause some lamp losses even when the external film is used, so that the *increase* in number of lamps destroyed when the inbuilt cutout is employed seldom or never represents a sufficient burden to offset the advantages of its use. In this connection it should be remembered that, except in certain localities, lightning strikes a street series line only perhaps once in several years or even less frequently, and then only a single circuit out of the many circuits employed.

Lamps equipped with the inbuilt cutout are perfectly adaptable for use on circuits equipped with film cutout socket. In such cases, a piece of mica at least .010-inch thick may be substituted for the film, or the regular film still continued if double protection is wanted.

Lamps equipped with inbuilt cutout are etched "Inbuilt Cutout" immediately below the etching which gives the lamp size and rating. There is, therefore, no difficulty in distinguishing them from lamps not so equipped.

This side road was illuminated, with G-E Novalux units, in order to attract rural customers to a particular business district in an Illinois city. The plan was highly successful

Rural lights lead to city business

A CITY'S commercial interests begin miles away from town. Across the countryside, in every direction, live customers for its stores, patrons for its amusements, and producers for its markets.

Hence, it is a matter of municipal concern that radiating highways be correctly lighted—lighted to invite rural traffic and to encourage rural business as well as to make the roads safe for the thousands of city motorists who must use them at night.

Cities usually pay a large percentage of the taxes of the county in which they are located. Therefore, they may justly insist on correct lighting of the surrounding traffic arteries. It is to the advantage of every citizen —every civic association and governing body—to promote the lighting of the highways. Country residents prefer the lighted road to one that is dangerous after dark. They find that correct lights reveal ditches and obstructions, pedestrians and horse-drawn vehicles.

General Electric specialists are at your service to make technical and commercial recommendations as to the lighting of highways.

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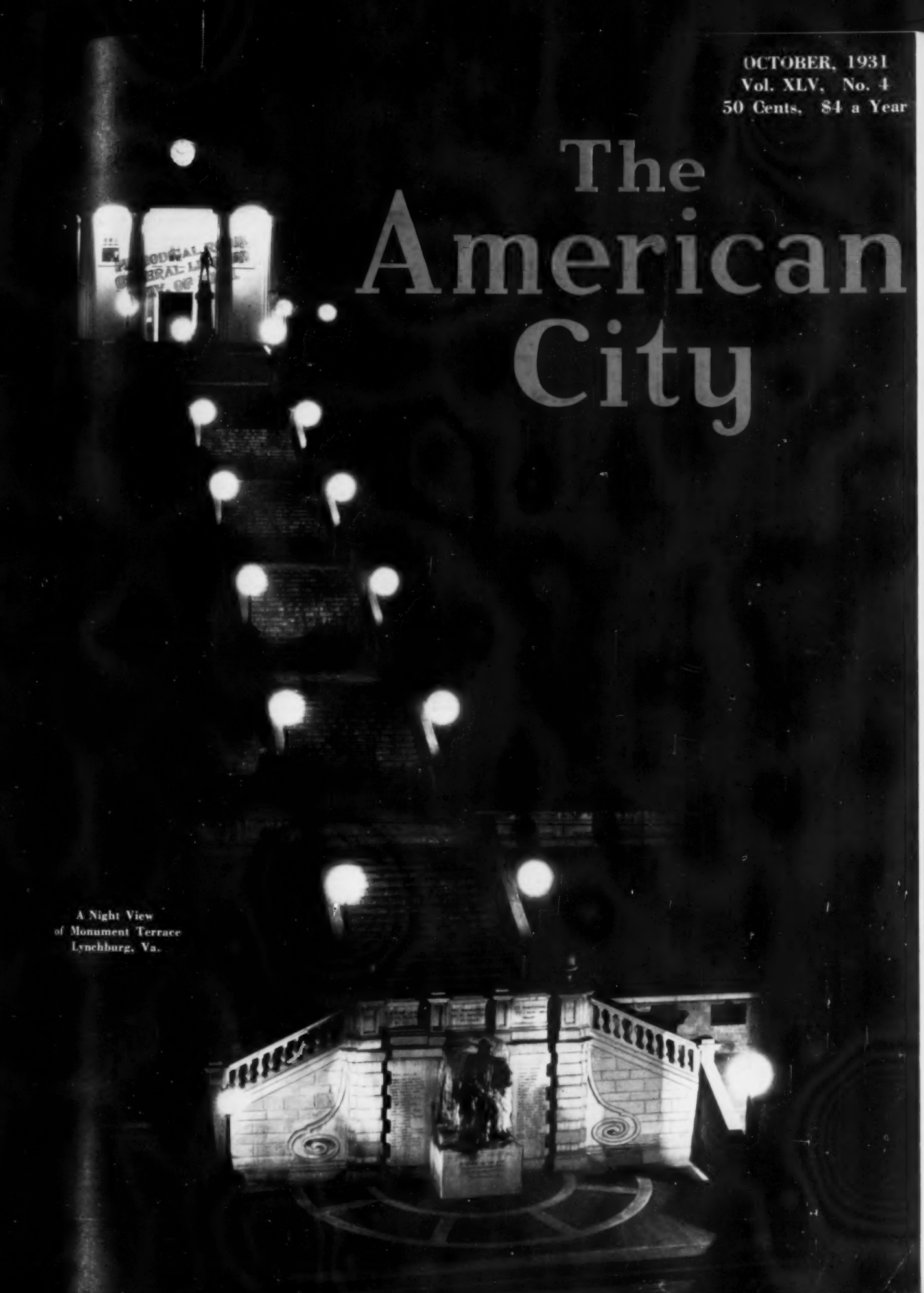

A Night View
of Monument Terrace
Lynchburg, Va.